Vol. 993 Number 5

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UNITED STATES PATENT AND TRADEMARK OFFICE

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April 29, 1980

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

April 29, 1980 Volume 993 Number 5

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Jan. 28, 1980. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of March 1980

Affirmed	173
Affirmed in part	33
Reversed	61
Total	267

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before May 30, 1980:

Chauza, Roger N., 6365 Glenbrook Ct., Lisle, Ill. 60532
Furrow, Joseph, 3022 Coleridge Dr., Los Alamitos, Calif. 90720
Keller, Paul A., 2756 Golfside, #707, Ann Arbor, Mich. 48104
McGuire, W. Michael, 2930 Pheasant Run, #13–G, Jackson, Mich. 49203
McTaggart, James E., 21470 Rambla Vista, Malibu, Calif. 92065
Schnall, Jerome, 2801 Quebec St., NW., Washington, D.C. 20008
Smith, Penelope A., 330 E. 49th St., #6–J, New York, N.Y. 10017

LUTRELLE F. PARKER,
Apr. 1, 1980. *Chairman, Committee on Enrollment.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,922,194, Re. S.N. 114,252, Filed Jan. 22, 1980, Cl. 435/30, PROCESS FOR PRODUCING 2-KETO-L-GULONIC ACID, Takayasu Sonoyama, et al., Owner of Record: *Shionogi & Co., Ltd., Osaka, Japan,* Attorney or Agent: Raymond C. Stewart, et al., Ex. Gp.: 172

4,059,409, Re. S.N. 096,745, Filed Nov. 23, 1979, Cl. 23/284, APPARATUS FOR ELIMINATING AMMONIA FUMES EMANATING FROM DIAZO COPIERS, Robert M. Barto, et al., Owner of Record: *Blu-Ray, Incorporated, Essex, Conn.,* Attorney or Agent: Roy C. Hopgood, et al., Ex. Gp.: 353

4,108,038, Re. S.N. 116,110, Filed Jan. 28, 1980, Cl. 84/1.03, TIME SHARED TONE KEYING SYSTEM IN ELECTRONIC MUSICAL INSTRUMENT, Eiichiro Aoki, Owner of Record: *Nippon Gakki Seizo Kabushiki, Hamamatsu-shi, Japan,* Attorney or Agent: W. Robert Spensley, et al., Ex. Gp.: 217

4,113,747, Re. S.N. 121,605, Filed Feb. 14, 1980, Cl. 260/348.25, PROCESS FOR THE PREPARATION OF PROPYLENE OXIDE, Gunther Prescher, et al., Owner of Record: *Bayer Aktiengesellschaft, Leverkusen, Germany, Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, Germany,* Attorney or Agent: Arthur Sprung, et al., Ex. Gp.: 121

4,148,073, Re. S.N. 073,314, Filed Sep. 7, 1979, Cl. 358/240, HIGH SPEED VIDEO DISPLAY SYSTEM INCLUDING ZOOM FEATURE, Gregory E. Slobodzian, et al., Owner of Record: *Stewart-Warner Corporation, Chicago, Ill.,* Attorney or Agent: Melvin M. Goldberg, Ex. Gp.: 233

4,172,231, Re. S.N. 117,371, Filed Jan. 31, 1980, Cl. 318/7, TRANSFER OF A FLEXIBLE WEB MEMBER FROM SUPPLY REEL TO A TAKE-UP REEL, Stephane M. D'Alayer de Costemore D'Arc, et al., Owner of Record: *Staar, S.A., Brussels, Belgium,* Attorney or Agent: John P. Bundock, Jr., et al., Ex. Gp.: 217

PATENT NOTICES

Certificates of Correction for the Week of April 29, 1980

D. 251,456	4,153,535	4,175,233	4,181,966
D. 251,611	4,156,362	4,175,953	4,182,155
3,674,562	4,158,049	4,175,991	4,182,310
3,825,819	4,158,472	4,176,882	4,182,431
3,970,256	4,162,300	4,176,999	4,182,614
4,013,510	4,163,053	4,177,167	4,182,661
4,016,542	4,163,760	4,177,240	4,182,886
4,041,196	4,165,385	4,177,291	4,183,219
4,080,268	4,166,119	4,177,518	4,183,453
4,082,881	4,166,426	4,177,554	4,183,524
4,090,942	4,166,743	4,177,638	4,183,907
4,111,306	4,169,114	4,177,977	4,183,986
4,119,535	4,169,842	4,178,292	4,183,997
4,120,217	4,169,992	4,178,444	4,184,166
4,126,225	4,170,714	4,178,458	4,184,299
4,128,608	4,172,203	4,178,639	4,184,833
4,132,481	4,172,562	4,178,697	4,185,131
4,133,722	4,172,921	4,178,740	4,185,256
4,135,871	4,173,211	4,178,751	4,185,502
4,142,697	4,173,403	4,178,772	4,185,537
4,147,636	4,173,655	4,178,779	4,186,110
4,148,603	4,174,046	4,179,408	4,186,330
4,151,108	4,174,291	4,180,988	4,186,533
4,152,770	4,174,886	4,181,102	4,187,307

Adverse Decisions in Interferences

In the designated interferences, involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,616,356, C. H. Roy, ELECTROLYSIS IN A PARTICULATE CARBON PACKING, Interference No. 98,259, decided Sept. 17, 1976, Claims 1–3.

Patent No. 3,816,409, A. Bauer, K. H. Weber, H. Merz, K. Zeile, R. Giesemann and P. Danneberg, 5-(PYRIDYL OR PHENYL) - 1H - 2,3,4,5-TETRAHYDRO - 1,5-BENZODIAZEPIN-4-ONES AND SALTS THEREOF, Interference No. 100,233, decided Dec. 19, 1979, Claim 1.

Patent No. 3,841,705, L. Girard and R. A. Hard, STIMULATION OF PRODUCTION WELL FOR IN SITU METAL MINING, Interference No. 99,293, decided Jan. 10, 1980, Claims 1, 2, 4–9.

Patent No. 3,947,170, W. Zimmermann, ROTARY FILM BLOWHEAD FOR MAKING TUBULAR FILMS OF THERMOPLASTIC MATERIAL, Interference No. 99,744, decided Dec. 19, 1979, Claim 1.

Patent No. 4,060,280, W. R. Van Loo, FLAME-RESISTANT CUSHION, Interference No. 100,213, decided Dec. 14, 1979, Claims 1, 3 and 4.

Patent No. 4,066,767, C. F. Schwender and B. R. Sunday, 8-(1H-TETRAZOL-5-YL)-11H-PYRIDO[2,1-B]QUINAZOLIN-11-ONES AND METHOD OF TREATING BRONCHIAL ASTHMA USING THEM, Interference No. 100,005, decided Dec. 18, 1979, Claim 4.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

Dedications

3,815,932.—*Verlyn C. Ruger,* Bellevue, Mich. FRONT GATE CONSTRUCTION FOR SHOPPING CART. Patent dated June 11, 1974. Dedication filed Feb. 11, 1980, by the assignee, *Roblin Industries, Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,870,541.—*Donald W. Watson,* Arlington Heights, Ill. SELECTIVE TRANSFER OF AN ELECTROSTATIC TONER IMAGE. Patent dated Mar. 11, 1975. Dedication filed Feb. 21, 1980, by the assignee. *Xerox Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent

3,914,042.—*Donald W. Watson,* Arlington Heights, Ill. TONER IMAGE TRANSFER APPARATUS. Patent dated Oct. 21, 1975. Dedication filed Feb. 21, 1980, by the assignee. *Xerox Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

Disclaimers

3,817,298.—*Francis B. Fishburne,* Asheville, N.C. VERTICAL PRESS APPARATUS WITH REMOTELY CONTROLLED DISTRIBUTOR. Patent dated June 18, 1974. Disclaimer filed Feb. 29, 1980, by the inventor.

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

4,186,846.—*Richard P. Jacalone,* Owosso, Mich., and *Lewis D. Poggiali,* West Chester, Ohio. BULK MATERIAL CONTAINER. Patent dated Feb. 5, 1980. Disclaimer filed Feb. 15, 1980, by the assignee, *Olinkraft, Inc.*

Hereby enters this disclaimer to all of the claims of said patent.

Disclaimer and Dedication

3,988,431.—*Joan K. Givas,* Springfield, N.J. and *Sidney Gutcho,* Monsey, N.Y. RADIOASSAY OF FOLATES. Patent dated Oct. 26, 1976. Disclaimer and Dedication filed, Feb. 20, 1980, by the assignee, *Becton, Dickinson and Company.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF FEBRUARY 23, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-9-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	10-3-78
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	4-2-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	5-30-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-12-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	8-31-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	11-16-78
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-16-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	8-21-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	9-20-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	3-20-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	12-14-78
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	2-5-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	1-15-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	10-18-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	10-2-78

Expiration of patents: The patents within the range of numbers indicated below expire during February 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,076,195 to 3,079,605, inclusive
Plant Patents ..... Numbers 2,224 to 2,231, inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,261

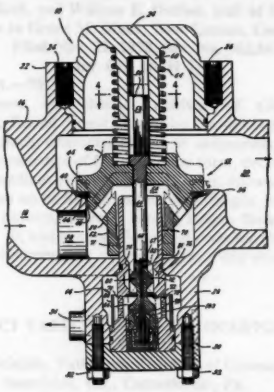
MODULATING FLOW CONTROL VALVE

Warren H. Brand, Blue Bell, Pa., assignor to Yarway Corporation, Blue Bell, Pa.

Original No. 4,019,527, dated Apr. 26, 1977, Ser. No. 554,401, Mar. 3, 1975. Application for reissue Apr. 4, 1978, Ser. No. 893,482

Int. Cl.[2] G05D *11/00*

U.S. Cl. 137—116 18 Claims



1. A modulating flow control valve assembly including main check valve means movable between a fully closed and a fully open position in response to flow of fluid from a pressure source to a demand system and including an intermediate position wherein the fluid flow to said demand system corresponds to a preselected minimum flow from said pressure source, and bypass valve means for controlling the flow of fluid from said pressure source to a recirculation system, said bypass valve means having a fully open position when said main check valve means is in its fully closed position and being movable to a fully closed position when said main check valve means is in its intermediate position, piston means operatively associated with said bypass valve means, said piston means being *located in a pressure chamber, said pressure chamber* being in fluid communication with the inlet side of said main check valve means whereby pressure at inlet side of said main check valve means is operative in moving said bypass valve means between said fully open and fully closed positions, pilot valve means *biased toward a closed position being located in said pressure chamber* for controlling the pressure acting on said piston means[.], *said pilot valve means being movable to its closed position solely because of said bias and being movable to its open position by said main check valve means.*

Re. 30,262

COMPRESSIVE LOAD CARRYING BEARINGS

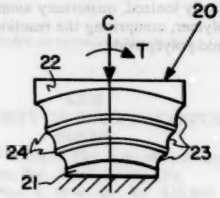
Warren E. Schmidt, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Original No. 3,679,197, dated Jul. 25, 1972, Ser. No. 147,488, May 27, 1971. Continuation of Ser. No. 893,886, Apr. 6, 1978, abandoned. Application for reissue Dec. 26, 1978, Ser. No. 553

Int. Cl.[2] B60G *11/22*

U.S. Cl. 267—152 4 Claims

1. A compressive load carrying laminated bearing comprising alternating bonded layers of a resilient material and a non-extensible material generally concentrically disposed about a common center with successive layers being disposed at successively increasing radii with the thickness of said layers of resilient material progressively increasing with radii while the



modules of elasticity of said layers of resilient material simultaneously decreases with radii.

Re. 30,263

CATCH MECHANISM

Stephen Horvath, St. Ives, Australia, assignor to Access Controls System Pty. Ltd., Melbourne, Australia

Original No. 4,015,869, dated Apr. 5, 1977, Ser. No. 618,119, Sep. 30, 1975. Application for reissue Jul. 21, 1978, Ser. No. 926,888

Claims priority, application Australia, Oct. 2, 1974, PB9139

Int. Cl.[2] E05B *15/02*

U.S. Cl. 292—341.16 10 Claims

1. A door catch mechanism comprising a body; a catch member pivotally mounted on the body to pivot between an operative position and an inoperative position; biasing means biasing the catch member toward its operative position; power operated detent means having a first condition in which said catch member is held in said operative position and a second condition in which said catch member is released such that it can be moved to its inoperative position against the action of said biasing means by a moving force applied directly to the catch member from without the catch mechanism; and heat responsive locking means operable in response to application of heat thereto when said catch member is in its operative position to lock the catch member to remain permanently in said operative position regardless of the condition of the detent means.

Re. 30,264

POLYMERIC PRODUCTS

Karl F. Schimmel, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Original No. 4,069,210, dated Jan. 17, 1978, Ser. No. 728,368, Sep. 30, 1976. Application for reissue Jan. 22, 1979, Ser. No. 5,521

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—29.2 EP 6 Claims

1. An internally ionized, quaternary ammonium salt group-containing polymer, comprising the reaction product of:

A. an organic polyepoxide,

B. a polyamine containing at least two tertiary amine groups, formed from reacting:

1. [a member selected from the class consisting of] an organic polyisocyanate, [an organic polycarboxylic acid, ester or anhydride, and mixtures thereof] *with*

2. an active hydrogen-containing tertiary amine in which the active hydrogen is selected from the class consisting of hydroxyl, mercapto, primary and secondary amino;

said reaction product being acidified so as to provide a quaternary ammonium salt group-containing polymer in which the salt groups are located along the polymer backbone.

PLANT PATENTS

GRANTED APRIL 29, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,526

CHRYSANTHEMUM PLANT

Jack M. Meek, and William E. Duffett, both of Salinas, Calif., assignors to Grace M. Mack, New Canaan, Conn.

Filed Nov. 22, 1978, Ser. No. 962,847
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the name of Compatriot and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, decorative capitulum type, medium yellow ray floret color, diameter across face of capitulum up to 60 mm., short plant height, semi-spreading branching pattern, average natural season flowering date of September 10, and average flowering response period of seven weeks in photoperiodic controlled short day program.

4,527

DISTINCT VARIETY OF STREPTOCARPUS NAMED VELMA

Gerhard Fleischle, Vaihingen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Nov. 8, 1978, Ser. No. 958,832
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of streptocarpus substantially as herein shown and described.

4,528

DISTINCT VARIETY OF STREPTOCARPUS NAMED FREDA

Gerhard Fleischle, Vaihingen, Fed. Rep. of Germany, assignor to Oglevee Associates, Inc., Connellsville, Pa.

Filed Nov. 8, 1978, Ser. No. 958,807
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Streptocarpus substantially as herein shown and described.

4,529

CHRYSANTHEMUM PLANT

Jack M. Meek, and William E. Duffett, both of Salinas, Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Dec. 4, 1978, Ser. No. 966,289
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., known by the cultivar name Yellow Superstar and particularly characterized as to uniqueness by the combined characteristics of daisy capitulum type; flat capitulum form; medium yellow ray floret color; diameter across face of capitulum from 100 to 120 mm. at maturity; uniform seven week photoperiodic flowering response; tall plant height; semi-upright branching pattern; and yellow green (immature) to yellow (mature) disc floret color.

PLANT PATENTS

DECEMBER 19, 1978

PATENTS

GRANTED APR. 29, 1980

ERRATA

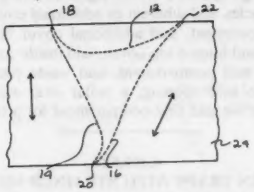
For CLASS	See PATENT NO.
433–175	4,199,864
433–021	4,199,865
366–139	4,199,866
368–252	4,199,930
368–318	4,199,931
368–080	4,199,932
410–094	4,200,046
526–064	4,200,145
220–020.5	4,200,205
371–018	4,200,224
371–027	4,200,225
371–009	4,200,226
273–236	4,200,298
282–027.5	4,200,313
280–492	4,200,315
430–091	4,200,461
430–494	4,200,462
430–317	4,200,463
430–512	4,200,464
430–527	4,200,465
430–566	4,200,466
423–335	4,200,485
435–291	4,200,493
264–262	4,200,514
424–246	4,200,575
424–246	4,200,576
424–281	4,200,577
548–193	4,200,578
424–180	4,200,581
525–243	4,200,593
423–070	4,200,612
430–030	4,200,665
525–398	4,200,729
525–398	4,200,730
525–437	4,200,731
455–092	4,200,837
371–022	4,200,838
455–003	4,200,839
455–226	4,200,840
455–169	4,200,841
367–135	4,200,858
367–011	4,200,859
364–570	4,200,896
365–208	4,200,917
365–210	4,200,918
365–230	4,200,919
367–001	4,200,920
367–087	4,200,921
367–096	4,200,922
367–123	4,200,923
365–005	4,200,924

PATENTS

GRANTED APRIL 29, 1980

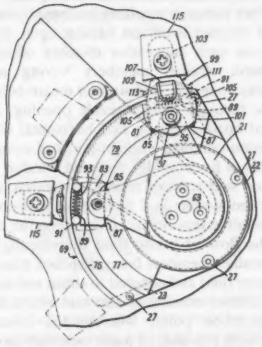
GENERAL AND MECHANICAL

4,199,822
BLOUSE
Orsolina L. Vasquez, Williamsburg, Mich., assignor to Free Form, Inc., Elk Rapids, Mich.
Filed Sep. 20, 1978, Ser. No. 943,786
Int. Cl.[2] A41D *1/18*
U.S. Cl. 2—106 **9 Claims**



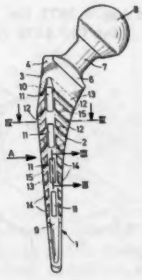
1. A garment comprising:
a first garment member, said first garment member being planar and substantially triangular in shape and having only three corners;
a second garment member, said second garment member being planar and substantially triangular in shape and having only three corners, said second garment member being separately constructed and detachable from said first garment member;
said garment being formed by wrapping said garment members around the body of a user and tying the corners of said member or members together wherein at least one corner of one member is tied to at least one corner of the other member to form a control knot; and
said control knot regulating the position of said garment on the user.

4,199,823
DISENGAGEABLE HELMET VISOR CLAMP
Alan N. Jenkins, Kenilworth, and Michael Taylor, Lower Norton, Near Warwick, both of England, assignors to Helmets Limited, Hertfordshire, England
Filed Nov. 23, 1977, Ser. No. 854,128
Int. Cl.[2] A42B *3/02*
U.S. Cl. 2—424 **18 Claims**



17. A protective helmet having a shell, optical means mounted on the shell for adjustment about an axis extending transversely through the shell, disengageable latching means to releasably hold the optical means against unintended displacement from a selected position of adjustment, and means operable upon disengagement of the latching means to adjust the position of the optical means, said helmet being characterized in that:
A. said latching means comprises means defining an arcuate track that is fixed with respect to the shell and has two uninterrupted smooth surfaces concentric to said axis;
B. a shoe movable along said arcuate track, said shoe having a first surface slidably engaging one of said uninterrupted smooth surfaces of the track and a second surface in spaced opposing relation with the other of said uninterrupted smooth surfaces of the track,
said second surface of the shoe being shaped to coact with said other surface of the track to define a pair of circumferentially spaced oppositely facing wedge-shaped spaces;
C. wedging elements in said spaces;
D. spring means yieldingly urging said wedging elements towards the narrow end of their respective wedge-shaped spaces, so that one of said wedging elements coacts with the surfaces it engages to hold the shoe against movement in one direction along the arcuate track while the other wedging element coacts with the surfaces it engages to hold the shoe against movement in the opposite direction;
E. manually actuatable latch releasing means mounted to move with and with respect to the shoe and operable to selectively move either wedging element out of wedging coaction with the surfaces it engages to thereby free the shoe for movement in a selected direction along the track and then move the shoe in that selected direction; and
F. means connecting the optical means with the shoe so that in one motion the latching means can be disengaged and the optical means moved to a selected position.

4,199,824
INTRAMEDULLARY STEM
Peter G. Niederer, Zollikofen, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Sep. 13, 1978, Ser. No. 941,939
Claims priority, application Switzerland, Oct. 12, 1977, 12436/77
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.913 **10 Claims**



1. An intramedullary stem for a bone implant having
a pair of at least approximately opposite sides;
a longitudinally extending groove in each said side; and
a plurality of recesses disposed in each side in a herring bone pattern and terminating in said groove therein, said recesses being directed towards one end of said stem.

4,199,825
BREAST PROSTHESIS

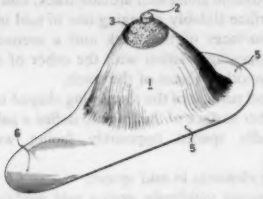
Bodo Knoche, Hildesheimer Strasse 213 A, 3014 Laatzen 1, Fed. Rep. of Germany

Filed Oct. 12, 1977, Ser. No. 841,478

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 7631795[U]; Oct. 25, 1976, 7633330[U]; Sep. 19, 1977, 2742140

Int. Cl.[2] A61F 1/00

U.S. Cl. 3—36 10 Claims



1. A breast prosthesis die cast and formed of a skin-colored soft silicone rubber cross-linked with an amount of hardeners such that it vulcanizes to a soft elastic material forming a prosthesis having an outer surface facing outwardly away from a wearer and an inner surface facing inwardly toward the wearer, and comprising an integral base including a central part, an edge extension and a flap-like section, said central part having a convex outer surface and a concave inner surface providing a hollow cup-shaped form, said convex outer surface having the shape of a female breast including a nipple and an areola, said concave inner surface having a breast-like shape and being spaced from the outer surface providing therebetween the wall thickness of the central part, and said central part having a passage through said nipple extending from the outer surface to said inner surface, said edge extension being thin and flexible and laterally enclosing said central part, said edge extension having a width outwardly from said central part so that said edge extension does not extend outwardly from the edge of a brassiere with which it is worn, said flap-like section connected to said edge extension and extending laterally outwardly from said central part toward the closer side of the wearer with said flap-like section having a length and width sufficient for covering the axillary lymph-gland area when the prosthesis is in place.

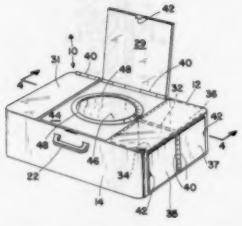
4,199,826
PORTABLE TOILET COMBINATION

Eileen Devereux, 86 Ft. Washington Ave., New York, N.Y. 10032

Filed Aug. 4, 1977, Ser. No. 821,746

Int. Cl.[2] A47K 11/02

U.S. Cl. 4—116 2 Claims



1. A portable toilet combination comprising an openably closed carrying case having a pair or parallel opposing sides, defining a front and a rear side, and a pair of parallel opposing ends, a handle being mountable on said front side, interior partitions inside said carrying case defining four separate compartments, a pair of said defining a first compartment and a second compartment, a longitudinally oriented partition intersecting one of said transverse partitions defining a third and fourth compartment, said four separate compartments being exteriorly accessible, said first and second compartments being accessible by means of hinged top covers and said third and fourth compartments being accessible by means of hinged end covers, all said covers being releasably lockable, said first compartment being adapted to house a waste receptacle for waste disposal use, said second compartment being capable of receiving and storing cleansing tissues, and said fourth compartment being capable or receiving and storing a plurality of waste receptacles, and wherein an additional cover is provided for said compartment, said additional cover being an inside cover under said hinged top cover, said inside cover having an opening into said compartment, said waste receptacle being insertable into said opening, a collar over said opening to provide a seat for said first compartment for a toilet user.

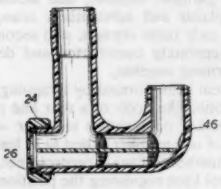
4,199,827
DRAIN TRAPS WITH STRAINER MEANS

Anthony Z. Tuleja, P.O. Box 1564, Sarasota, Fla. 33578

Filed Oct. 4, 1977, Ser. No. 839,207

Int. Cl.[2] E03C 1/26

U.S. Cl. 4—289 1 Claim



1. Strainer means disposed in a U-shaped drain trap comprising of continuous conduit means including substantially vertical parallel conduit sections and a horizontal conduit section, forming curved conduit sections at their junctures, said continuous conduit means comprising of conduit extension means outwardly disposed from the horizontal conduit section in line with a horizontal section and disposed at the curved juncture, said conduit extension means comprising a closeable opening, said horizontally disposed conduit section and conduit extension disposed at the natural sedimentation point of said drain trap, said strainer means comprising rod means having a series of cup-shaped strainer members having open mesh surfaces disposed thereon each successive member of said series of cup-shaped mesh strainer members having progressively smaller mesh size openings, said strainer means being insertable and removable through said closeable opening, said strainer means disposed horizontally in said horizontal disposed conduit and extension conduit, wherein said rod means is parallel to interior walls of horizontally disposed conduit and conduit extension, when said strainer means is inserted, said strainer means is disposed within said horizontally disposed conduit means and conduit extension and in said conduit means in the direction of the flow of waste fluid therethrough, said cup-shaped mesh strainer members being disposed transverse to the flow of said waste fluid and adapted to strain and detain foreign particles and articles carried in the said waste fluid at said natural sedimentation point, wherein the removal of the strainer means with cup-shaped mesh members having a diameter somewhat smaller than the inner diameter of the horizontally disposed conduit section and conduit extension, from said horizontally disposed conduit and conduit extension cleans the said section of foreign particles and articles strained by said strainer members wherein said removal cleans deposits in the said conduit section carried in the waste fluid where said hori-

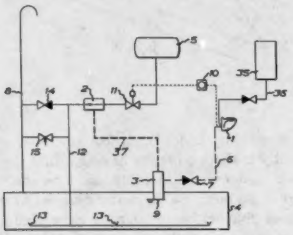
zontally disposed section is disposed at the natural sedimentation point of the drain trap.

4,199,828

VACUUM TOILET APPARATUS FOR MOBILE UNITS

Bo G. Hellers, Malmö, Sweden, assignor to Evak Sanitar AB, Bromolla, Sweden

Filed Jan. 17, 1979, Ser. No. 4,233
Claims priority, application Sweden, Jan. 23, 1978, 7800779
Int. Cl.[2] B60R *15/04*
U.S. Cl. 4—321 **3 Claims**



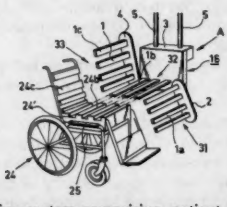
1. In a vacuum toilet apparatus for mobile units, comprising
(a) at least one toilet stool;
(b) means for producing a vacuum;
(c) a storage container;
(d) conduits with valves for conveying material from the toilet stool to said storage container by means of said vacuum;
(e) a sluice connected into the conduit ahead of the storage container; and
(f) means for supplying flushing liquid to the toilet stool,
the improvement that said means for producing a vacuum consists of a pneumatic ejector which is connected to a compressed air reservoir, the compressed air which is supplied to the ejector for vacuum production being led, after the ejector, to the storage container for oxygenating the contents thereof.

4,199,829

NURSING SYSTEM

Shigeru Watanabe, Tanashi; Michiyasu Ishida, Nagaokakyo, and Hideo Iwasaki, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1978, Ser. No. 870,829
Claims priority, application Japan, Jan. 26, 1977, 52-7546
Int. Cl.[2] A61G *7/08*
U.S. Cl. 5—81 R **7 Claims**



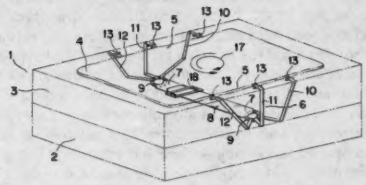
1. A nursing system comprising: patient carrier means having a number of forks supported at one ends by side plates so as to constitute a backrest, seat, and footrest; transferring means having runway rails secured in preselected locations, and a trolley adapted to travel along said rails, said trolley holding said patient carrier means in such a manner as to permit upward and downward movement of said carrier means; nursing aids, such as a toilet and bathtub, disposed within the reach of said patient carrier means; and a bed having a plurality of lands and furrows, or alternately raised and sunken portions formed on the mat surface correspondingly to said forks of said patient carrier means.

4,199,830

HOLDING APPLIANCE FOR USE IN A BLANKET OR A COVERLET AND THE LIKE

Yoshie Ogata, 10-4, 4 chome, Nishiochiai Sinjuku-ku, Tokyo, Japan

Filed Aug. 31, 1978, Ser. No. 938,532
Int. Cl.[2] A47C *21/02*
U.S. Cl. 5—411 **6 Claims**



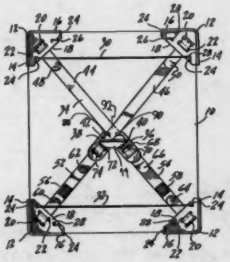
1. An improved holder appliance for use in a blanket or the like disposed on a mattress having support means and a plurality of fastening means to fasten the blanket on the bed, wherein, the improvement comprises: a pair of supporter-straps having respective first ends connected with one another in alignment and laterally disposed between a base member and said mattress: connecting means fitted at said first end of one strap and adjustably engaged with an opposed end of said other strap; a plurality of bands radially extending from each other end of said supporter-strap; and a clip connected to the free end of said each band, for holding the side of said blanket.

4,199,831

MATTRESS SECURING APPARATUS

Sylvio Müller, 21 Brookdale Rd., Glen Cove, N.Y. 11542

Continuation-in-part of Ser. No. 830,464, Sep. 6, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 974,194
Int. Cl.[2] A47C *22/00*
U.S. Cl. 5—411 **8 Claims**



1. A mattress securing apparatus for securing a mattress resting on a mattress supporting device, said device having an uppermost mattress supporting surface thereon disposed adjacent to and above side walls of said device, said mattress having an uppermost lateral surface and a lowermost lateral surface and four corners extending between said uppermost and said lowermost surfaces of said mattress, said uppermost surface of said mattress being disposed over said lowermost surface of said mattress when said mattress is disposed resting on said supporting surface, said mattress securing apparatus comprising four corner guards, each of said corner guards includ-

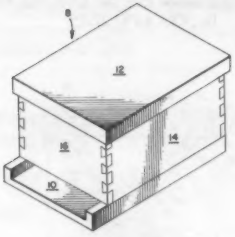
ing a first plate, said first plate having two legs, said first plate having a first end and a second end, said two legs forming a right angle, a second plate, said second plate secured to said first plate, a lateral surface of said second plate being disposed normal to said legs, a harness, said harness removably secured to each of said four corner guards at said second plate portion thereof, said harness including a first and a second and a third flexible strap, the ends of said first flexible strap adjustably removably secured to a first and a second of said four corner guards, one end of said second flexible strap adjustably removably secured to a third of said four corner guards, one end of said third flexible strap adjustably removably secured to a fourth of said four corner guards, a third plate, the other ends of said second flexible strap and said third flexible strap and a portion of the length of said first flexible strap removably connected to said third plate, bias means for urging said each of said four corner guards towards the center of said supporting surface when said each of said four corner guards are disposed at said corners of said mattress and when said second plate is disposed intermediate said supporting surface and said lowermost surface of said mattress when said mattress is in said position on said supporting surface and when said first end of said first plate resides below said uppermost surface of said mattress and said second end of said first plate resides adjacent said walls of said mattress supporting device and when said first end of said first plate is in clamping engagement only with said mattress and said second end of said first plate is in clamping engagement with said device, including a portion of the length of said second and said third flexible straps each having a spring intermediate the ends thereof, cord means for flexibly connecting any one pair of adjacent pairs of said corner guards together when said second plate is disposed in said use position.

4,199,832

MOLDED POLYURETHANE BEEHIVES

David E. Glasscock, P.O. Box 707, Mont Belvieu, Tex. 77580, and Jackie B. Pearson, 23230 Bayleaf, Spring, Tex. 77373

Filed Dec. 13, 1977, Ser. No. 860,267
Int. Cl.[2] A01K *47/00*
U.S. Cl. 6—1 4 Claims



1. A beehive constructed of panels molded with wall thicknesses of between about one-half inch and two inches, of closed cell polyurethane foam having a density of between 4 and 50 pounds per cubic foot, namely: a molded bottom, a molded cover and molded wall panels, and means for securing said panels to form a beehive which is acceptable to a bee colony, said foam having been formed by foaming a composition including:

(a) at least one polyol;

(b) at least one amine catalyst;

(c) at least one foaming agent; and

(d) at least one isocyanate;

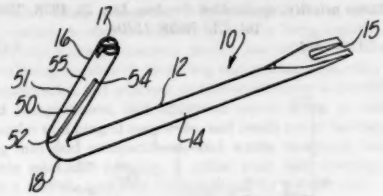
and wherein the amine catalyst is selected from the group consisting of amines exhibiting a sufficiently low vapor pressure in the foamed polyurethane product that the foamed polyurethane beehive is acceptable to the bees.

4,199,833

CARTON OPENING DEVICE

Fred Z. Sitkins, 2239 22nd St., and David A. Hill, 2441 12th St., both of Wyandotte, Mich. 48192

Filed Feb. 22, 1978, Ser. No. 880,145
Int. Cl.[2] B66F *15/00*
U.S. Cl. 7—166 4 Claims



1. A carton opening device comprising,

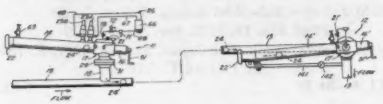
a substantially L-shaped handle having a first leg, a second leg, and a corner section joining said legs, the free end of said second leg having a diametric channel formed thereacross, said channel being adapted to engage a retaining wire on a carton whereby rotation of said first leg coaxially about said second leg stretches and breaks a retaining wire positioned in the channel, said second leg further having an elongated slot extending inwardly from a first point at the outer surface of said corner section toward a second point axially spaced along said second leg and terminating short of the free end of said second leg near the axis of said second leg, said slot being adapted to receive a retaining band of a carton and to break the band upon rotation of said handle about the axis of said second leg.

4,199,834

PIG BALL TRANSFER UNIT

John D. Muchow, Long Beach; Graham J. Jones, Cypress, and Maurice Siegers, Lakewood, all of Calif., assignors to Willis Oil Tool Co., Long Beach, Calif.

Filed Jul. 27, 1978, Ser. No. 928,359
Int. Cl.[2] B08B *9/04*
U.S. Cl. 15—104.06 A 10 Claims



1. A transfer unit for use in combination with a pipeline to transfer pig balls into and out of the pipeline through a branch conduit thereof, comprising:

a substantially T-shaped hollow housing including an axially extending passage and an offset passage in communication with each other;

means forming an elongated magazine in axial alignment with and at one end of said axially extending housing passage, said offset passage having a straight axis forming an oblique angle relative to said axially aligned passage and said elongated magazine, said angle being obtuse as measured between said magazine and said offset passage whereby said unit may be connected to a pipeline with said offset passage perpendicular thereto and with said magazine sloping downwardly toward said offset passage or downwardly away from said offset passage to serve selectively as a ball launching means or a ball receiving means;

means for supporting an axially movable valve member at

the other end of and axially aligned with said housing passage;

annular seating means disposed between said hollow housing and said magazine in facing relation with said axially movable valve member;

said T-shaped hollow housing also including means for connecting its offset passage with the branch conduit of the pipeline;

actuating means operatively coupled with said valve member for extending it into engagement with said annular seating means to isolate said magazine from the pipeline and for retracting said valve member to permit communication between said magazine and the pipeline; and

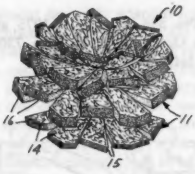
at least one hydraulically actuated plunger extending into said magazine into a discharge path of movement of pig balls from the magazine, and being retractable to release the balls for discharge from the magazine, and means for applying fluid pressure from said magazine to said plunger in a direction to oppose and equalize the force exerted on the plunger by any fluid pressure in the magazine tending to move the plunger in its retractable direction.

4,199,835

SCOURING BALL

Raymond F. Heyer, Saint Paul, Minn., and Gary J. Klecker, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 12, 1979, Ser. No. 11,521
Int. Cl.[2] A47L *17/08*
U.S. Cl. 15—209 B **7 Claims**



1. A scouring pad substantially in the shape of a highly conformable ball comprising a plurality of radially slit, regular-shaped, planar segments of conformable, lofty, low-density, nonwoven abrasive product fastened together under compression at their centers with fastening means, wherein the stack of segments have in the uncompressed state a thickeness to average diameter ratio in the range of about 1:1 to about 1:3, each of said segments being slit along a line from the outer edge toward its center in the average range of about 10% to 80% of the distance of said line to provide from about 5 to about 12 radially disposed equally spaced slits which define a plurality of radially aligned lobes having a width at least 3/16 inch at the narrowest point, with lobes in the same segment being capable of being alternatively at least temporarily positioned above and below the plane of such segment, whereby the total array of lobes in said pad defines said ball shape.

4,199,836

PAINT PAN

August O. Lovmark, P.O. Box 10471, South Lake Tahoe, Calif. 95731

Filed Apr. 13, 1979, Ser. No. 29,659
Int. Cl.[2] B44D *3/12*
U.S. Cl. 15—257.06 **4 Claims**

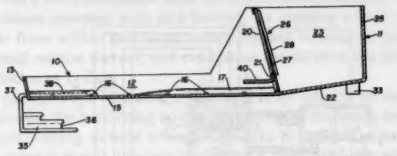
1. A pan for use with a paint roller comprising:

a shallow receptacle having side walls, an end wall, and a bottom deck wide enough to accept a paint roller;

a contiguous reservoir for paint extending above said deck and connecting to said deck through a paint supply passageway in a wall sloping so that the top of said reservoir is wider than the bottom of said reservoir;

said reservoir having a floor sloping toward said passageway;

a valve element hinged to said sloping wall and moveable within said reservoir between an open position and a closed position;



said valve element including a closure portion which is adapted to overlay said passageway in said closed position; and

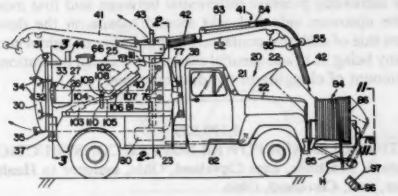
actuating means extending from said valve element to a position above said deck whereby movement of said actuating means effects movement of said valve element from said closed position and gravity and hydrostatic pressure of paint urge said valve element toward said closed position.

4,199,837

APPARATUS FOR SEWER CLEANING AND THE LIKE

Benjamin P. Fisco, Jr., Shaker Heights, Ohio, assignor to Aquatech, Inc., Cleveland, Ohio

Filed Feb. 13, 1978, Ser. No. 876,900
Int. Cl.[2] B08B *3/02, 9/04*
U.S. Cl. 15—302 **29 Claims**



1. Apparatus for cleaning a chamber, which comprises:

a wheeled vehicle;

a single horizontally extending tank assembly mounted on said vehicle, said tank assembly having a fixed divider forming a first tank portion adapted to carry a supply of water and a second tank portion adapted to receive and hold debris, the vertical cross sections of the tank assembly being generally the same along its horizontal length so that the first and second tank portions both extend substantially from the front of the tank assembly to the rear of the tank assembly, said tank assembly having a rear door adapted to be opened to discharge debris from said second tank portion;

a conduit extending from said tank assembly and connected to said second tank portion, the end of said conduit adapted to be lowered into the chamber to be cleaned;

means for creating suction in said second tank portion to suck debris through said conduit and into said second tank portion; and

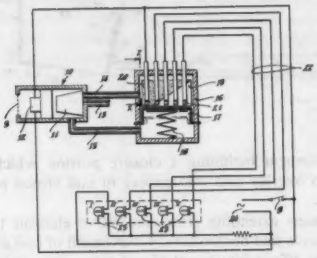
a hose reel mounted on said vehicle, said reel having a hose connected to said first tank portion, said hose adapted to be inserted into the chamber to discharge water thereinto.

4,199,838

INDICATING DEVICE FOR VACUUM CLEANERS

Sven B. Simonsson, Tyreso, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Sep. 11, 1978, Ser. No. 941,241
Claims priority, application Sweden, Sep. 15, 1977, 7710316
Int. Cl.[2] A47L 9/28
U.S. Cl. 15—339 **6 Claims**



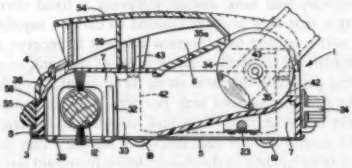
1. In a vacuum cleaner having a dust container therein and a casing provided with means movable under the influence of a varying pressure differential and dividing said casing into two parts, first means communicating between the space on the upstream side of said dust container and one part of said casing, second means communicating between the space on the downstream side of said dust container and the other part of said casing, the invention comprising: an indicating device in the form of a plurality of light sources visible from the outside of said vacuum cleaner showing the degree of clogging of said dust container, a plurality of corresponding electric circuits for said light sources, said movable means having an electrically conductive circuit making member for sequentially closing each of said electric circuits to light the respective light source in response to said movable means moving under the influence of an increasing pressure differential between said first means on the upstream side and said second means on the downstream side of said dust container, said plurality of light sources thereby being lit in a sequential manner as a visual indication of the amount of clogging of the dust container.

4,199,839

SUCTION CLEANER POWER NOZZLE CONSTRUCTION

Eugene F. Martinec, East Cleveland, Ohio, assignor to Health-Mor, Inc., Cleveland, Ohio

Filed Oct. 12, 1978, Ser. No. 950,733
Int. Cl.[2] A47L 5/34
U.S. Cl. 15—354 **7 Claims**



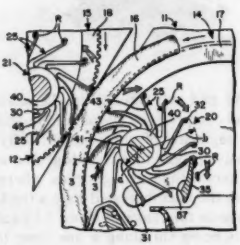
1. In suction cleaner power nozzle construction of the type having a housing, a power driven rotary brush in the housing, adjustable nozzle supporting wheels in the housing, wheel height adjusting mechanism in the housing, a rotary brush drive motor in the housing, suction mouth and main suction duct passages in the housing, and a movable tubular wand connector journaled in the housing; the combination of a main housing member, an auxiliary housing member, and a housing bottom plate member forming said housing; exteriorly accessible first screw means engaging and connecting the bottom plate and main housing member; there being openings formed in the bottom plate member; second screw means also accessible exteriorly of the housing and removable through said openings and engageable with the main and auxiliary members connecting and holding assembled said main and auxiliary members; the main member being located intermediate the auxiliary and bottom plate members and forming an upper compartment above the main member extending between the main and auxiliary members, and a lower compartment below the main member extending between the main and bottom plate members; said power nozzle rotary brush being located in the lower compartment and being journaled at one end in the upper compartment and at its other end in the lower compartment; a partition wafer mounted on the brush adjacent said one brush end through which wafer said brush rotatably extends; said wafer being slidably removably mounted on the main member to locate said one brush end in the upper compartment; said brush drive motor being mounted in the upper compartment; drive belt means in the upper compartment operatively connecting the drive motor and said one brush end; said adjustable nozzle support wheels being mounted in the lower compartment, there being openings formed in the bottom plate through which said wheels are movable to adjusted positions; and said wheel adjusting mechanism being mounted in the lower compartment; whereby upon removal of said second screw means the auxiliary member may be replaced without disturbing the remainder of the power nozzle.

4,199,840

SCRAPER BLADE STRUCTURE FOR MEAT CLEANING MACHINE

Herbert R. Crane, Tipp City, Ohio, assignor to Hobart Corporation, Troy, Ohio

Continuation of Ser. No. 566,366, Apr. 9, 1975, abandoned. This application Oct. 6, 1976, Ser. No. 730,135
Int. Cl.[2] A22C 17/00
U.S. Cl. 17—16 **5 Claims**



1. In a meat scraper for scraping residues such as bone dust and meat particles from an essentially planar sawed surface of a cut of meat, said scraper including:

means for guiding a meat cut with the planar surface thereof following a predetermined path,

a plurality of scraper elements supported adjacent and covering the entire width of the meat path,

each of the elements having a hub, and a plurality of flexible scraper blades extending from each said hub along divergent planes, and

means for rotating the elements to bring them into scraping contact with the sawed surface of the meat;

the improvement comprising:

each of the divergent planes of the scraper blades being tangential to said hub and extending in a rearward direction with respect to the normal direction of rotation of said hub, and

means on each said blade providing a tip section thereon including a scraping edge which extends forwardly with respect to the remainder of the blade in the normal direction of rotation and presents a thin flat scraping edge

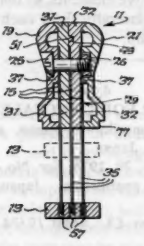
which is maintained substantially perpendicular to, and follows the counter of, the surface of the cut of meat during substantially all of the interval when said scraping edge intersects the path of the cut of meat as said hubs are rotated, to cooperate during rotation of said elements to scrape over substantially the entire area of the meat surface moving along said path to remove such residues from the meat surface without substantial abrasion thereof or loss of saleable meat therefrom.

4,199,841

HAND MEAT TENDERIZER

André R. Jaccard, Holland, N.Y., assignor to Jaccard Corporation, Buffalo, N.Y.

Filed Nov. 22, 1977, Ser. No. 853,840
Int. Cl.[2] A22C 9/00
U.S. Cl. 17—30 **6 Claims**



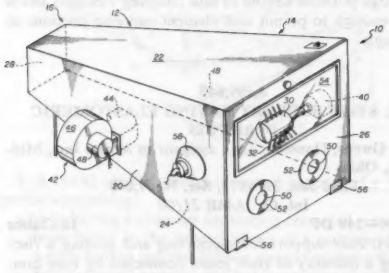
6. A blade segment assembly adapted for use in a manually operated meat tenderizer which comprises a plurality of blade segments and a spacer block between and in contact with a pair of said segments, each of said segments comprising a thin metal plate having a plurality of spaced, sharpened knife blades projecting from one edge thereof; said spacer block and said segments being approximately the same length and said block having a longitudinally extending abutment on each side thereof, each abutment being adapted to be engaged by the top edge of one of said segments whereby to maintain said segments aligned, and said block being so formed as to permit an interfitting ridge and groove connection with another, adjacent block.

4,199,842

FEATHER REMOVING APPARATUS AND METHOD

Camille F. Bergeron, Rte. 1, Box 98, Broussard, La. 70518

Filed Nov. 8, 1978, Ser. No. 958,608
Int. Cl.[2] A22C 21/02
U.S. Cl. 17—47 **2 Claims**



1. A device for plucking feathers from fowl and the like comprising:

(a) a housing having a large and a small section, tapered walls that form a venturi-shape, and including a discharge orifice at said small section thereof;

(b) a rotatable means positioned within said larger section of said housing;

(c) a plurality of elongated resilient flailing members mounted with said rotatable means and extending radially outwardly therefrom for removing feathers and the like from a fowl positioned adjacent said rotatable means;

(d) means mounted with said housing for creating a flow of air from within said large section of said housing to said small section thereof, and exhausting the air flow out said discharge orifice;

(e) passageways mounted within said large section of said housing for permitting an operator to insert his hands into said housing to hold a fowl or the like in position as said rotatable means removes the feathers from the fowl, said passageways restricting the flow of air around the operator's arms and into said large section for collecting the removed feathers and exhausting the feathers out said discharge orifice; and

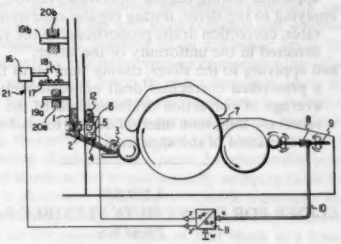
(f) a window mounted within said large housing section whereby the operator may observe the fowl therein being plucked of its feathers.

4,199,843

APPARATUS FOR PRODUCING A UNIFORM CONTINUOUS CARD SLIVER

Ferdinand Leifeld, Kempen; Wolfgang Beneke, and Hermann Trützschler, both of Mönchen-Gladbach, all of Fed. Rep. of Germany, assignors to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,356
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1977, 2704241
Int. Cl.[2] D01H 5/32
U.S. Cl. 19—240 **5 Claims**



1. In apparatus including a carding machine provided with a feed roll and arranged to produce a card sliver, a rotatable delivery device having an adjustable rate of rotation for delivering fibers to the feed roll at a rate determined by its rate of rotation, a measuring device disposed for continuously providing a measuring result representative of the size of the card sliver, a regulating device connected to receive the measuring result produced by the measuring device and to produce a control signal representative of deviations between the actual measuring result and a desired result, and a setting device connected to control the rate of rotation of the delivery device, the improvement wherein: said setting device comprises a rotatable input member connected to be driven by, and in unison with, said feed roll, a rotatable output member connected to be driven by said input member and to drive said delivery device, and means including an electric motor connected to receive the control signal from said regulating device and arranged to vary the ratio between the rotation rates of said input and output members over a continuous range as a function of said control signal in a manner to regulate the speed

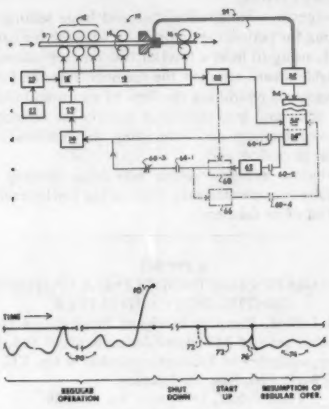
of said delivery device in a direction to eliminate such deviations.

4,199,844

METHOD AND MEANS FOR REGULATING SLIVER DRAFT UNIFORMITY

David J. Goetzinger, Greenville, S.C., assignor to Platt Saco Lowell Limited, Helmshore, England

Filed Apr. 25, 1978, Ser. No. 899,778
Int. Cl.[2] D01H *5/42*
U.S. Cl. 19—240 **20 Claims**



1. A method of regulating the uniformity of textile sliver drafted by a sliver drafting apparatus during periods of start-up and regular operation of the apparatus, comprising:

detecting uniformity variations of the sliver drafted by the apparatus during regular operation thereof;

applying to the sliver, during regular operation of the apparatus, correction drafts proportional to the variations then detected in the uniformity of the sliver;

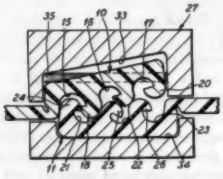
and applying to the sliver, during start-up of the apparatus, a prescribed correction draft approximately equal to an average of correction drafts applied to the sliver over a relatively long time interval during the last-ensuing regular operation of the apparatus.

4,199,845

SLIDER FOR HEAVY DUTY FLEXIBLE FASTENER TRACKS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Feb. 8, 1978, Ser. No. 876,020
Int. Cl.[2] A44B *19/04*
U.S. Cl. 24—201 C **8 Claims**



1. A flexible reopenable slide closure structure comprising in combination:

first and second flexible plastic continuous fastener strips each having at least three complementary continuous coactingly shaped interlocking releaseable rib and groove elements extending longitudinally on the strips;

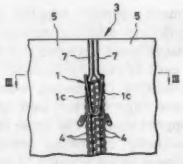
and a closure slider positioned on said strips having means for guiding the slider along the strips and having first and second faces in opposing relationship for pressing the strips together to interlock said rib and groove elements when the slider is moved in a closing direction along the strips, said first face having a ridge which projects toward said second face for pressing the strips together progressively from one side of the strips and faces to the other side of the strips and faces, said ridge extending from said one side to said other side laterally across the strips and having a first leading portion and a second portion with the second portion located in successive relationship to the first portion having regard to said closing direction so that at least one of said rib and groove elements is pressed into interlocking relationship at a different time than the other rib and groove elements, so that said rib and groove elements do not laterally fight each other in moving to closing relationship.

4,199,846

END STOPPER FOR CONCEALED FASTENER

Hideaki Matsuo, Namerikawa, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Nov. 29, 1978, Ser. No. 964,463
Claims priority, application Japan, Dec. 5, 1977, 52/162932[U]
Int. Cl.[2] A44B *19/24*
U.S. Cl. 24—205.11 R **11 Claims**



1. An end stopper for concealed fasteners having coupling elements and fastener tapes supporting said coupling elements secured thereto, comprising a resilient material body having a base portion and a pair of spaced clipping portions projected from said base portion, said clipping portions in combination resiliently clipping the abutting portions of said fastener tapes, said base portion being bent in a manner such that the plane containing the base portion and the plane containing said clipping portions will cross each other, said base portion having an open space, which is enough wide to therein compressively receive element carrying portions of said fastener tapes or fastener edge portions devoid of said coupling elements and is spaceous enough to permit said element carrying portions to pass through.

4,199,847

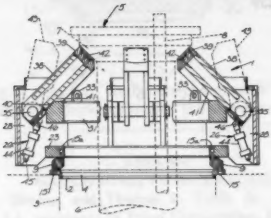
WELL RISER SUPPORT HAVING ELASTOMERIC BEARINGS

James H. Owens, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

Filed Jan. 29, 1979, Ser. No. 7,049
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—249 DP **16 Claims**

1. A well riser support for supporting and guiding a riser comprising a plurality of riser joints connected by riser connectors through a rotary table containing a central bore dimensioned to pass the riser to facilitate coupling or uncoupling joints of riser pipe, said riser support comprising an annular bearing ring configured to rest upon and be supported by the

rotary table and having a central opening substantially coaxial with the rotary table bore and dimensiond to pass the riser as it is being raised or lowered therethrough, a plurality of resilient bearings circumferentially spaced around the upper surface of said bearing ring, each of said bearings being configured to absorb and distribute loads applied parallel to and transversely of the riser, and a substantially ring-like spider assembly resting upon and supported by said bearings, said spider assembly having a central bore therein substantially coaxial with said bearing ring bore and dimensioned to pass the



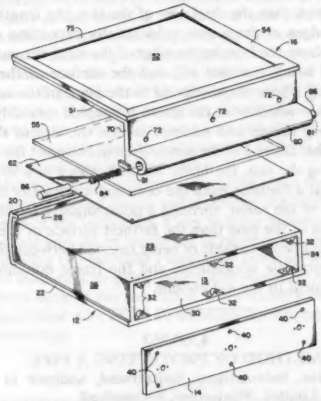
riser as it is being raised or lowered therethrough, said spider assembly including a plurality of circumferentially spaced rotatable dogs, each of said dogs being rotatable between a retracted position wherein said dog contacts the outer surface of said riser connector to support the riser while said joints are being coupled or uncoupled thereto, and an extended position wherein said dogs are brought out of contact with the riser connector such that the riser may be raised or lowered free of said dogs, said spider assembly further including means to rotate said dogs between said retracted and extended positions.

4,199,848

BURIAL URN

Howard W. Kohnert, 940 Drake St., Denver, Colo. 80221

Filed May 8, 1978, Ser. No. 903,896
Int. Cl.² A61G *17/00*
U.S. Cl. 27—1 **17 Claims**



1. A burial urn for storing cremated remains of a deceased person comprising:

a body having a chamber for storing cremated remains, said body being in the general shape of a portion of a book with a hollow interior having an inlet opening for admitting cremated remains and having a closure plate releasably attached to said body for closing said inlet opening; and

display means removable from said body for mounting and displaying a memorial of a deceased person, said display means including:

a frame removably attached to said body and having a rectangular framed opening;

a transparent cover removably retained on said body by said frame; and

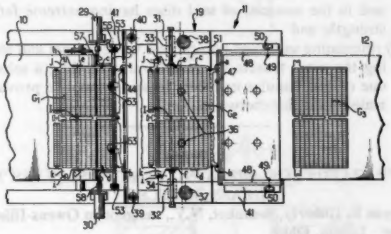
a backing plate removably attached to said frame for retaining the cover on the frame and for defining a spaced for a memorial between said cover and said backing plate.

4,199,849

METHOD OF AND MACHINE FOR MANUFACTURING SUPPORT GRIDS FOR STORAGE BATTERY ELECTRODE PLATES

Jean-Pierre Moreau, Le Grand Quevilly, France, assignor to Baroclem S. A., Courbevoie, France

Filed Apr. 10, 1978, Ser. No. 894,917
Claims priority, application France, Apr. 18, 1977, 77 11627
Int. Cl.² B26D *7/16*
U.S. Cl. 29—2 **14 Claims**



1. In the method for manufacturing grids or plate supports cast from lead based metals for use in storage batteries wherein the cast is formed as a blank having an irregular periphery and a size greater than that of the grid to be obtained and wherein the casts are sequentially supplied to an automatic press for trimming of the excess, the improvement comprising the steps of positioning said blanks prior to entry into said press by stopping them for a predetermined period of time in abutment against a rectractable crossmember perpendicular to the direction of feeding, thereafter releasing said grid blanks thus positioned and feeding them into said press, longitudinally positioning the grid blanks so fed to said press by stopping them for a second time in abuttment against a retractable transverse bar and laterally centering said grid blanks in the press by intermittantly tapping on the opposite edges of said blank in a transverse direction passing substantially along the center of mass of said blank, and subsequently trimming the peripheral portion of the blank in said press.

4,199,850

METHOD OF MAKING A DIAPHRAGM VALVE

Adolf K. Velan, Westmount, Canada, assignor to Velan Engineering Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 612,590, Sep. 11, 1975, abandoned. This application Sep. 27, 1977, Ser. No. 837,204
Int. Cl.² B23P *15/00*; F16K *41/12*
U.S. Cl. 29—157.1 R **11 Claims**

1. A method of making a valve bonnet with cage unit for a valve for controlling transmission of critical fluids, comprising the step of:

(a) stacking a plurality of thin metal discs;

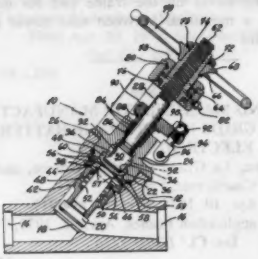
(b) sandwiching said stacked discs between a pair of annular members, at least one of which is compatible to be welded to said bonnet;

(c) maintaining said discs in said position between said annular members and applying a weld completely around the

peripheral edges of said discs and said annular members to thereby form a peripherally sealed cage unit;

(d) deforming said sandwiched metal discs to a selected contour;

(e) heat treating said cage unit by subjecting the same to an annealing and aging process resulting in stress relieving



and in the material of said discs having extreme fatigue strength; and

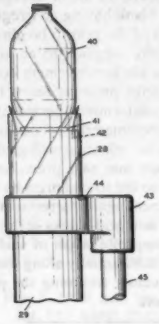
(f) orientating said cage unit on said valve bonnet and securing the same thereto by peripherally welding a selected one of said annular members to said bonnet to provide a sealed joint therebetween.

4,199,851

APPARATUS FOR APPLYING PLASTIC SLEEVES TO GLASS BOTTLES

Thomas E. Doherty, Setauket, N.Y., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 16, 1978, Ser. No. 961,339
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—235 **9 Claims**



1. In an apparatus for forming plastic sleeves and attaching them to rigid base articles, the apparatus including a mandrel, means for forming the plastic sleeve about the mandrel, means for positioning the rigid base article adjacent the mandrel at one end of the plastic sleeve, and means for telescoping the plastic sleeve onto the rigid base article, telescoping means comprising:

means for moving the plastic sleeve from the mandrel and telescoping the plastic sleeve over the rigid base article;

a source of pressurized fluid;

first means connected to said pressurized fluid source for forming a cushion of pressurized fluid between the exterior surface of the mandrel and the interior surface of the plastic sleeve while the plastic sleeve is being moved; and

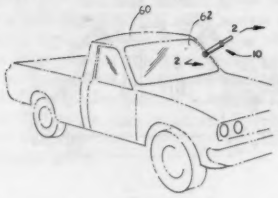
second means connected to said pressurized fluid source for forming a cushion of pressurized fluid between the exterior surface of the rigid base article and the interior surface of the plastic sleeve while the plastic sleeve is being telescoped over the rigid base article.

4,199,852

WINDSHIELD REMOVER

Lewis W. Ayers, 35141 Mesa Grande, Calimosa, Calif. 02320, and William A. Chellel, 8541 Barry Pl., Westminister, Calif. 92683

Filed Nov. 22, 1978, Ser. No. 963,224
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—239 **2 Claims**



1. A windshield remover capable of semi-automatic removing of automobile windshields, comprising:

an airtool;

a longitudinal base disposed about an axis and having a first end capable of being coupled to the airtool and powered by the airtool and a second end having a surface defining a planar slot parallel to the axis and further defining a bore near the center of the slot and perpendicular to the slot;

coupling means coupled to the bore;

axially symmetric roller means axially coupled to the coupling means coupled to the bore and capable of rotating around the coupling means, the roller means having a radius greater than the distance from the center of the bore to the end of the second end of the base and a diameter greater than the greatest thickness second end of the base;

L-shaped blade means having a first stem end comprising a generally arrow shaped generally planar shoulder slightly less thick than the thickness of the slot, the length of the two edges of the arrow substantially exceeding the distance from the bore to the edge of the base, the end of the arrow being rounded off, and the surface of the arrow defining a bore perpendicular to the plane of the arrow by means of which bore the arrow is coupled rotatably to the coupling means and retained within the slot of the base such that the end of the arrow does not contact the surface defining the slot, the blade means bending at a 90 degree angle at a distance from the bore slightly greater than the radius of the roller, forming a point slightly farther from the axis of the base than the farthest surface of the roller, the point being capable of being inserted between the edge of automobile windshields and the frame coupling each windshield to the automobile.

4,199,853

METHOD OF PROTECTING A PIPE

Hans Fricker, Sulz-Attikon, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

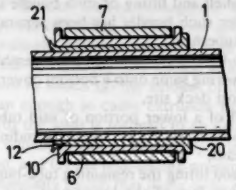
Filed Aug. 21, 1978, Ser. No. 935,111
Claims priority, application Switzerland, Sep. 13, 1977, 11140/77
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—415 **13 Claims**

1. A method for protecting a pipe comprising the steps of

moving a C-shaped open base element radially over a pipe of circular cross-section;

bending the element about the pipe to form a ring-shaped sleeve;

thereafter welding the ends of the element together approximately along a generatrix; and



inserting at least two wedge shaped arcuate shells between the pipe and sleeve to wedge the sleeve onto the pipe.

4,199,854

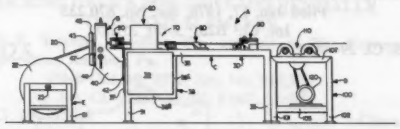
CABLE STRIPPING METHOD

James L. Bitting, and Thomas L. Tubb, Jr., both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 872,070, Jan. 25, 1978. This application Dec. 26, 1978, Ser. No. 972,978

Int. Cl.[2] H02G 1/12

U.S. Cl. 29—426.5 **2 Claims**



1. A method of stripping or removing the outer insulating casing from a multi-wire armor covered, lead jacketed, insulated flat electrical cable comprising the steps of:

a. Feeding the cable through a guide means into a means for making a plurality of longitudinal cuts in the cable;

b. Making a plurality of longitudinal cuts to predetermined depths in the cable, a plurality of said cuts being made paralleledly and spaced apart from the top down through the armor, through the lead jacket, through the insulation and down to the wire, and at least one of said longitudinal cuts being made from the bottom through the armor;

c. Moving the cable with the longitudinal cuts therein through an armor stripping means and stripping the armor from the cable thereby reducing the cable to a plurality of individual lead jacketed wires;

d. Moving the individual lead jacketed wires through a lead jacket stripping means and removing the lead jacket from each of the individual wires thereby reducing each individual wire to an insulation covered wire; and

e. Moving the individual insulation covered wires through an insulation stripping means and removing the insulation from each of the individual wires thereby reducing each individual wire to a wire substantially stripped of all outer coverings.

4,199,855

PLASTIC DUST TUBE FOR SHOCK ABSORBER AND METHOD OF MANUFACTURE

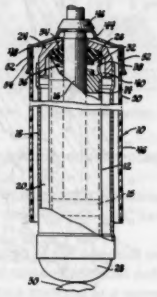
Alan J. McClellan, Germantown, Ohio, assignor to General Motors Corporation, Detroit, Mich.

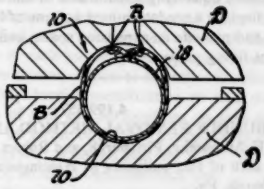
Division of Ser. No. 915,146, Jun. 14, 1978, Pat. No. 4,167,992. This application Nov. 17, 1978, Ser. No. 961,522

Int. Cl.[2] B23P 11/02

U.S. Cl. 29—450 **2 Claims**

1. A method of making and attaching a plastic dust tube to a cylindrical shock absorber having an annular cover plate attached to the piston rod of the shock absorber comprising the steps of inserting a flat flexible blank of plastic material and a predetermined rectangular conformation on a support, locating a shock absorber immediately above said plastic blank, moving said shock absorber relative to said support and into contact with said blank to thereby deflect said blank so that it extends around a portion of said shock absorber and so that opposite side portions thereof project upwardly and said blank bends into a generally U-shaped cross sectional configuration, curling the upwardly projecting side portions onto one another





until the edges of said side portions are adjacent to one another, securing said side portions with finger-like tabs on each side interlaced to one another adjacent to the edges thereof to thereby form a tubular member, removing said shock absorber and said tubular member from said support, and axially moving said tubular member into said cover plate and attaching said tubular member to said cover plate by means of radially inwardly extending tabs on said cover plate deflecting said tubular member to seat said tabs into openings in the end of the tubular member.

4,199,856

METHOD OF PROVIDING LUBRICANT VOLUME DISPLACEMENT SYSTEM FOR A ROTARY ROCK BIT

James T. Farrow, Grand Prairie; William D. Vanderford, and Ernest E. Taylor, both of Irving, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jul. 31, 1978, Ser. No. 929,613

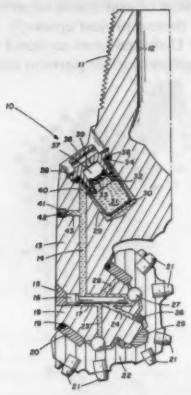
Int. Cl.[2] B23P 19/04

U.S. Cl. 29—454 **5 Claims**

1. A method of providing an expansion space in the lubricant reservoir of a rotary rock bit, said rotary rock bit having a lubricant reservoir cavity, a flexible diaphragm in said lubricant reservoir cavity dividing the lubricant reservoir cavity into a lubricant portion on the lubricant portion side of said flexible diaphragm and pressure equalizing portion on the pressure equlizing portion side of said flexible diaphragm, a passage extending from said pressure equalizing portion of said lubricant reservoir cavity to the outside of said bit and a lubricant filling passageway connected with said lubricant portion of said lubricant reservoir cavity, comprising the steps of:

filling said lubricant portion of said lubricant reservoir cav-

ity with lubricant by introducing said lubricant through said lubricant filling passageway into the lubricant portion on the lubricant portion side of said flexible diaphragm; forcing a fluid through said passage into said pressure equal-



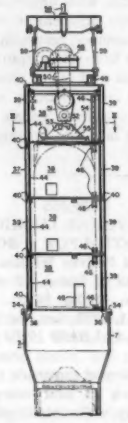
izing portion of said lubricant reservoir cavity on the pressure equalizing portion side of said flexible diaphragm to displace a predetermined volume of lubricant from said bit and provide an expansion space; and sealing said lubricant filling passageway.

4,199,857

TUBE BUNDLE REMOVAL METHOD AND APPARATUS

Robert E. Meuschke, Pittsburgh, and Robert W. Beer, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 901,659
Int. Cl.[2] B23P *19/04*
U.S. Cl. 29—157.4 **4 Claims**



1. Method of removal of a tube bundle from an opened-top vertical cylindrical shell of a steam generator, comprising the steps of,

placing an open-bottom hollow cask assembly onto the upper open end of said shell in coaxial extension upwardly therefrom, said cask assembly being reinforced longitudinally, having a tube-bundle-lifting crane means at its upper end, and having multiple longitudinal sections interconnected by removable means,

effecting coupling of said crane means to the tube bundle within said shell and lifting of such bundle into said cask assembly after such bundle has been separated from the generator's tubesheet,

lifting the tube-bundle-containing cask assembly from such shell and lowering same onto a bottom cover member at a nearby support deck site,

effecting cutoff of a lower portion of said tube bundle for disposition within the lowermost longitudinal section of said cask means,

disconnecting and lifting the remaining tube-bundle-containing cask means free of the lowermost cask section and placing such remaining cask means on a respective bottom cover member,

repeating the preceding cutoff and lifting steps until the entire tube bundle is disposed in respective longitudinal sections of said cask means, and

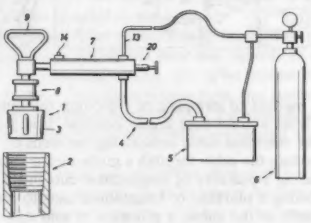
adding top cover members to the tube-bundle-section-containing cask sections.

4,199,858

METHOD FOR AUTOMATICALLY LUBRICATING PIPE JOINT

Franciscus H. Meijs, New Orleans, La., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 17, 1978, Ser. No. 870,233
Int. Cl.[2] B23P *3/00, 25/00*
U.S. Cl. 29—458 **2 Claims**



1. In a well-treating process in which fluid is conveyed to or from a subterranean reservoir through a pipe string containing threaded pipe joints, an improved procedure for avoiding impairment in the permeability of the reservoir which comprises:

cleaning the threads of the pipe joint elements to the extent required to ensure a substantial freedom from contaminated lubricants or solid debris;

arranging a lubricant nozzle-positioning means so that it positions lubricating orifices along a selected portion of the threads of either the box or pin elements of the pipe to be used each time the nozzle-positioning means is brought into associative contact with those elements;

connecting the lubricating orifices, through a fluid conduit having sufficient flexibility to permit the thread-contacting movements of the nozzle-positioning means, to a source of lubricant under a pressure capable of causing a selected rate of flow of lubricant;

connecting a repetitively-actuatible volume-metering means to the fluid conduit so that each actuation of the metering means permits a selected volume of lubricant to flow toward the lubricating orifices;

adjusting the volume-metering means to preset said selected amount of lubricant that is allowed to flow at a volume correlated with the thread surface area within the pipe joints to be connected to provide a volume that is capable of lubricating and sealing substantially all of that area without significant overflow;

said lubricant that is allowed to flow being determined by

tests conducted on a pipe string at least equivalent to the one being installed by (1) connecting at least one joint in which the pin or box is lubricated with a preselected amount of lubricant flowed through the volume-metering means, (2) disconnecting at least one so-connected joint and determingin whether lubricant was extruded from between the threads, (3) leak testing at least one so-connected joint in which (a) the amount of lubricant applied is less than enough to cause extrusion from between the threads, (b) the joint is torqued to an extent at least substantially equalling that to be employed in making up the pipe string, and (c) the leak-testing pressure differential at least substantially equals that likely to be encountered in a well in which the pipe string is being installed, and (4) selecting as the amount of lubricant to be allowed to flow through the volume-metering means an amount which, in the condition of said tests, is sufficient to lubricate and seal the pipe joint threads without extrusion; and,

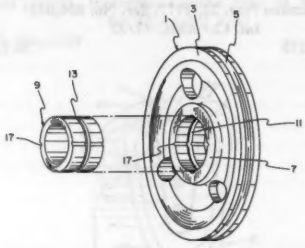
making up the pipe string by associateively contacting each box or pin element with the nozzle-positioning means and actuating the volume-metering means and subsequently mating each lubricated element with the corresponding unlubricated element.

4,199,859

LOCKING DEVICE FOR CIRCUMFERENTIALLY ORIENTED ELEMENTS

Donald F. Swavely, Reading, Pa., assignor to The Polymer Corporation, Reading, Pa.

Filed Oct. 10, 1978, Ser. No. 949,770
Int. Cl.[2] B23P *19/00*; F16C *33/08*
U.S. Cl. 29—526 R **3 Claims**



1. A method for assembling a plastic low friction bushing within a plastic rotatable machine element such as a gear, wheel or sheave for mounting the assemblage on a shaft for rotation which comprises:

forming a circumferential half round groove in the interior diameter of the machine element;

forming a half round circumferential groove in the outside diameter of the bushing;

drilling a radial passageway in the bushing to communicate from its inside diameter to its circumferential groove;

positioning the bushing within the element and aligning the respective circumferential half round grooves to form a closed annular channel;

filling the channel with a plurality of resilient plastic spheres by introducing them through the radial passageway of the bushing;

capping the radial passageway to prevent the escape of the resilient spheres; and

axially pinning the machine element to the bushing to prevent rotation of the machine element relative to the bushing,

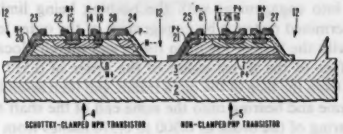
whereby the machine element and the bushing may be non-destructively separated.

4,199,860

METHOD OF INTEGRATING SEMICONDUCTOR COMPONENTS

Howard R. Beelitz, Gillett, Pa., and Donald R. Preslar, Somerville, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 11, 1977, Ser. No. 850,672
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 C **9 Claims**



1. A method of integrating semiconductor components comprising:

providing as starting bulk material a semiconductor single crystal body of low conductivity and having opposed major surfaces,

producing a collector region of the opposite conductivity at a first location in one of said surfaces and defining a collector region of said starting material at a second location in said one surface spaced from said first location,

insulatedly attaching a wafer handle to said one surface,

producing a base region, a base contact portion in the base region and an emitter region in the second major surface at each of said first and second spaced locations, the base contact portion at each location being produced simultaneously with the emitter region at the other location,

applying a Schottky barrier metallization to said starting material at one of said spaced locations on said second surface to form by virtue of the low conductivity of said material an integrated Schottky barrier,

applying associated terminal metallizations, and

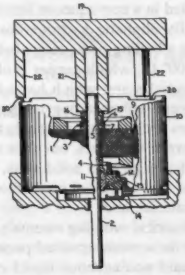
anisotropically etching into said second surface as far as said one surface to form boundaries for surrounding said locations to thereby dielectrically isolate a complementary pair of semiconductor components in mesa form.

4,199,861

METHOD OF MAKING AN END PLAY CONTROL ASSEMBLY

John B. Buckman, and Robert E. Lykes, both of Troy, Ohio, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Division of Ser. No. 815,098, Jul. 13, 1977, Pat. No. 4,164,674.
This application Feb. 14, 1979, Ser. No. 12,238
Int. Cl.[2] H02K *15/14*
U.S. Cl. 29—598 **8 Claims**



1. A method of manufacturing an assembly for a dynamoelectric machine to control the end play of a rotatable shaft extending through the main frame of the machine and having

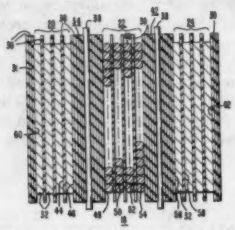
a rotating member secured thereto inside the main frame of the machine, which comprises securing a bushing to the shaft adjacent at least one end of the rotating member, slip fitting a thrust collar onto the shaft into engagement with the bushing, assembling an ultrasonic horn over the shaft having inner and outer spaced annular legs with the inner leg receiving the end of the shaft upon which the thrust collar is located, energizing the horn to move the same inwardly of the shaft and weld the thrust collar to the bushing with the axially extent of the thrust collar into engagement with the bushing being limited to a predetermined distance by engagement of the outer leg of the horn with the face of the main frame and thereby locating the outer face of the thrust collar of the order of 0.513 to 0.518 inches from the face of the main frame, and then assembling the end frame and bearing onto the same end of the shaft to locate the bearing of the order of 0.500 to 0.510 inches from the face of the main frame to thereby provide a clearance between the bearing and thrust collar of the order of 0.003 to 0.018 inches sufficient to compensate for the tolerance buildup of the parts throughout the machine and at the same time limit the end play of the shaft.

4,199,862

METHOD OF CONSTRUCTING AN ELECTRICAL WINDING ASSEMBLY

William S. Gorton, Jr., and Richard D. Buckley, both of Athens, Ga., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 17, 1978, Ser. No. 925,084
Int. Cl.[2] H01F *41/12*
U.S. Cl. 29—605 **5 Claims**



1. A method of constructing an electrical winding assembly comprising the steps of:

winding an electrical conductor into a plurality of radially-spaced layers about a central axis;

disposing an electrical insulating material between at least certain of said layers of said electrical conductor;

applying a slurry, formed of solid, heat-reactive resin particles suspended in a non-aqueous liquid carrier comprising a substantially aliphatic hydrocarbon distillate of petroleum having a boiling point range between about 150° C. and about 300° C., which carrier is chemically inert with said resin particles and which has a boiling point higher than the normal polymerizing temperature range of said resin particles such that substantially all of said non-aqueous liquid carrier vaporizes, but does not boil, as said resin particles polymerize to a solid state, between certain of said layers of said electrical conductor and said electrical insulating material; and

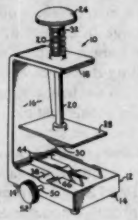
heating said electrical winding assembly at a predetermined temperature for a predetermined period of time sufficient to volatize said non-aqueous liquid carrier and to cause said resin particles to soften and flow between adjoining layers of said electrical conductor and said electrical insulating material and form cohesive bonds therebetween as said resin particles polymerize to a solid state.

4,199,863

PILL CUTTER

Rosalie E. Deckert, 3417 Elmwood, Wichita, Kans. 67218

Filed Jul. 12, 1978, Ser. No. 923,791
Int. Cl.[2] A61J *3/00*; B26B *17/00*
U.S. Cl. 30—124 **5 Claims**



1. A device for cutting a pill in half comprising:

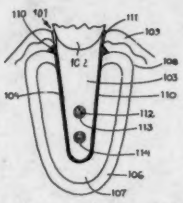
a base; a surface on said base to support a pill; opposed retainer plates mounted on said base for centering a pill, means for moving said plates toward and away from each other in substantially equal amounts for accomodating different size pills; and blade means disposed above the base and movable downwardly between said plates to cut said pill in half.

4,199,864

ENDOSSEOUS PLASTIC IMPLANT METHOD

Arthur Ashman, 200 Central Park South, New York, N.Y. 10019

Division of Ser. No. 643,405, Dec. 22, 1975, abandoned. This application Nov. 22, 1977, Ser. No. 854,031
Int. Cl.[2] A61C *13/22*
U.S. Cl. 433—175 **30 Claims**



1. In the method of fabricating a plastic endosseous implant wherein a freshly extracted tooth is used as a master in preparing a replica mold corresponding to at least a root portion of said tooth, the improvement comprising the steps of:

(a) attaching to the interior surface of the mold a dense layer of water soluble crystals of a particle size corresponding to a pore size desired in a surface region of the root portion of the implant,

(b) mixing acrylic polymer and monomer with water-soluble crystals of a particle size corresponding to a pore size desired in a subsurface region of the root portion of the implant in volume portions to provide a preselected degree of porosity therein,

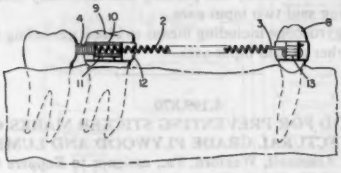
(c) pouring such mixture in said mold,

(d) curing the mixture in said mold to form a plastic replica corresponding to at least the root portion of said tooth,

(e) removing the surface layer of plastic from the root portion to expose the water-soluble crystals, and

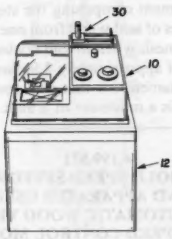
(f) leaching said salt from said replica to produce porous surface and subsurface regions in at least the root portion of the tooth having predetermined pore size and porosity.

4,199,865
ORTHODONTIC SPRING APPLIANCE AND ASSEMBLY
Steve B. Cain, 11006 NW. 58th St., Parkville, Mo. 64152
Filed May 16, 1977, Ser. No. 796,987
Int. Cl.[2] A61C 7/00
U.S. Cl. 433—21 4 Claims



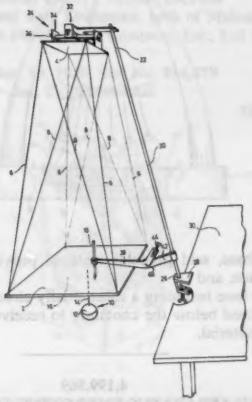
1. A double action retraction coil spring useful for providing a substantially steady work force on a tooth to be retracted which comprises a single strand of spring tempered wire formed into a closed first coil having at one end a tail and at the other end an enlarged open second coil, said second coil formed over at least a portion of said first coil, and said tail being adapted to be affixed to said tooth to provide the desired work force on said tooth when said spring is activated.

4,199,866
DENTAL AMALGAMATION APPARATUS
Frederick H. Drury, Winterburn, Canada, assignor to Weatherford Oil Tool Co., Ltd., Edmonton, Canada
Filed Jun. 20, 1977, Ser. No. 808,416
Claims priority, application Canada, Mar. 18, 1977, 274242
Int. Cl.[2] A61C 3/00
U.S. Cl. 366—139 11 Claims



1. A dental amalgamator comprising:
a casing,
a capsule holder and drive means therefor, said capsule holder being located outside the casing, said drive means being mounted within the casing, an arm connecting the capsule holder to the drive means,
a lid movable to a closed position in which the lid forms with a portion of the external surface of the casing an enclosure which surrounds the capsule holder, said enclosure-forming portion of the external surface of the casing including an aperture, said enclosure having air inlet means to allow air to flow thereinto from the atmosphere,
said casing being substantially sealed except for an outlet adapted for connection to a vacuum source, whereby during amalgamation air may be drawn by the vacuum source into the enclosure, the air mixing with mercury vapors within the enclosure and then being drawn through said aperture into the casing and thence out of said outlet.

4,199,867
HARMONOGRAPH
George Cass, Gelber St. 22, Ramat Danya, Jerusalem, Israel
Filed Feb. 9, 1979, Ser. No. 11,047
Claims priority, application Israel, Feb. 23, 1978, 54114
Int. Cl.[2] B43L 11/00
U.S. Cl. 33—27 L 8 Claims



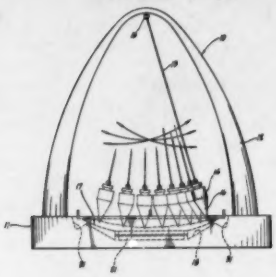
1. A collapsible and compactable harmonograph adapted to generate compound harmonic oscillations and thereby record different, complex, consistent, geometrical patterns of diminishing scope, comprising
(a) a drawing surface
(b) means for freely suspending said drawing surface, said suspension means comprising gimbal means mounted above the drawing surface, a member secured to said gimbal means for conjoint movement therewith and a plurality of vertical and diagonal flexible collapsible suspension cords arranged in a selected manner connecting said member to the drawing surface to permit said drawing surface to undergo pendulum-like oscillations in an infinite number of vertical planes, but to be substantially restrained from performing rotational or torsional oscillations about its central vertical axis by virtue of said diagonal cords;
(c) a bob suspended by a flexible, collapsible suspension cord attached to the bottom side of said drawing surface, and
(d) a stylus mountable independently of said drawing surface to contact said drawing surface at an adjustable contact pressure and to be held in positive contact therewith during the compound harmonic oscillation effected by the interaction of said two linked gravity pendulums.

4,199,868
AMUSEMENT DEVICE FOR TRACING GEOMETRICAL FIGURES
R. James Steward, 100 Francois, Florissant, Mo. 63031
Filed Mar. 5, 1979, Ser. No. 12,866
Int. Cl.[2] B43L 11/00
U.S. Cl. 33—27 L 3 Claims

1. An amusement device for tracing geometrical figures, comprising:
(a) means for providing a base,
(b) an arch member operatively carried by the base,
(c) means providing a marking surface carried by the base,
(d) pendulum means attached to the arch member in suspended relation above the marking surface and including marking means engageable with the marking surface for tracing figures thereon, and
(e) bearing means disposed between the base and the con-

tainer permitting rotation of the container relative to the base,

(f) the means providing the marking surface including a container of loosely packed granular material mounted on



the base, said granular material providing the marking surface, and

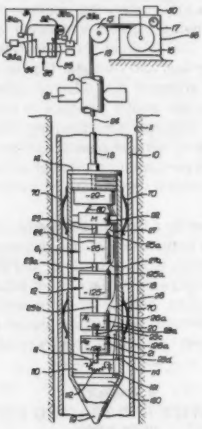
(g) the base including a substantially circumferential trough disposed below the container to receive overflow granular material.

4,199,869

MAPPING APPARATUS EMPLOYING TWO INPUT AXIS GYROSCOPIC MEANS

Donald H. Van Steenwyk, San Marino, Calif., assignor to Applied Technologies Associates, San Marino, Calif.

Filed Dec. 18, 1978, Ser. No. 970,625
Int. Cl.[2] G01C 9/00
U.S. Cl. 33—302 **37 Claims**



27. In mapping apparatus, the combination comprising:

(a) a gyroscope and a carrier frame therefor, and a housing for said gyroscope and carrier frame, the housing adapted to be suspended in a bore hole for lengthwise travel therealong,

(b) the gyroscope characterized as having a spinning rotor and torsion structure defining a gimbal, and wherein the rotor spin frequency has a predetermined relation to a resonant frequency of said structure,

(c) the gyroscope further characterized as having two input axes, and an output axis about which the spin rotor rotates,

(d) drive means operatively connected with said frame to rotate the frame about one of said axes,

(e) the gyroscope having means to detect rotor pivoting about one of said two input axes in response to said rotation of the frame,

(f) the gyroscope including a motor to rotate the spinning rotor and said torsion structure including mutually orthogonally extending primary and secondary torsion members through which rotation is transmitted from the motor to the rotor, said primary and secondary members defining said two input axes,

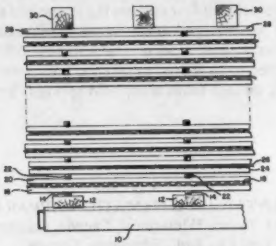
(g) the gyroscope including means to block gimbaling about the other of said input axes.

4,199,870

METHOD FOR PREVENTING STICKER MARKS ON ARCHITECTURAL GRADE PLYWOOD AND LUMBER

Robert D. Arsenault, Wexford, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 9, 1978, Ser. No. 867,761
Int. Cl.[2] F26B 3/04
U.S. Cl. 34—24 **3 Claims**



1. In a method of kiln drying a wood product which has been treated by a water-borne agent including the steps of layering the wood on a kiln tram, providing spaces between said layers of wood on said tram and placing the loaded tram in a kiln for drying, the improvement comprising the step of:

separating the faces of said wood from one another by means of coated wire mesh wherein said coated wire mesh has a mesh opening of approximately 2 inches and is convoluting ¾ inch in diameter so that said spaces between said layers of wood is a minimum of ¾ inch.

4,199,871

AUTOMATIC HOLD SPEED SETTING CONTROL METHOD AND APPARATUS USED WITH A CONTINUOUS AUTOMATIC WOOD VENEER DRYER CONVEYOR SPEED CONTROL MONITORING COMPUTER APPARATUS

Donald D. Ward, Sumner, and Arthur W. Emigh, Jr., Redmond, both of Wash., assignors to Ward Systems, Inc., Sumner, Wash.

Filed Feb. 23, 1978, Ser. No. 880,579
Int. Cl.[2] F26B 3/00
U.S. Cl. 34—25 **7 Claims**

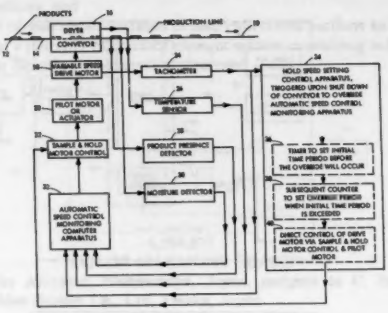
1. A method of holding speed settings of a conveyor of a wood veneer dryer, when conveying wood veneers being dried, when being controlled by an automatic conveyor speed control monitoring computer apparatus, comprising:

(a) determining automatically when the conveyor of the wood veneer dryer has stopped by previously observing signals being generated by the motion of the conveyor;

(b) determining automatically the conveyor of the wood veneer has been stopped for a full predetermined initial shutdown period;

(c) holding the speed settings of the conveyor of the wood veneer dryer, if the dryer remains shut down throughout the initial predetermined period, until at least a wood veneer row count has occurred of the wood veneers

leaving the dryer to determine that a length of the conveyor supporting the wood veneers overdried within the


PRODUCTS
DRYER
CONVEYOR
VARIABLE SPEED DRIVE MOTOR
PILOT MOTOR OR ACTUATOR
SAMPLE & HOLD MOTION CONTROL
AUTOMATIC SPEED CONTROL MONITORING COMPUTER APPARATUS
PRODUCTION LINE
TACHOMETER
TEMPERATURE SENSOR
PRODUCT PRESENCE DETECTOR
MOISTURE DETECTOR
HOLD SPEED SETTING CONTROL APPARATUS, TRIGGERED UPON SHUT DOWN OF CONVEYOR TO OVERRIDE AUTOMATIC SPEED CONTROL MONITORING APPARATUS
TIMER TO SET INITIAL TIME PERIOD BEFORE THE OVERRIDE WILL OCCUR
SUBSEQUENT COUNTER TO SET OVERRIDE PERIOD WHEN INITIAL TIME PERIOD IS EXCEEDED
DIRECT CONTROL OF DRIVE MOTOR VIA SAMPLE & HOLD MOTOR CONTROL & PILOT MOTOR

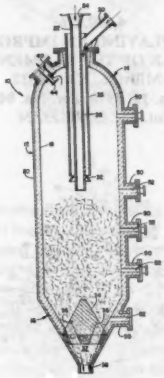
dryer, has been moved out of the conveyor, when dryer operations have again been resumed.

4,199,872

REGENERATION APPARATUS FOR PRODUCING SULFUR DIOXIDE

William F. Bischoff, Califon, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Sep. 8, 1977, Ser. No. 831,575
Int. Cl.[2] F26B 9/06
U.S. Cl. 34—79 **4 Claims**



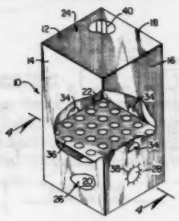
1. An apparatus for heating a carbonaceous material to produce a gas, said apparatus comprising a reactor vessel, means for introducing said carbonaceous material and a heated inert heat exchange medium into said vessel for mixing and transferring the heat from said heat exchange medium to said carbonaceous material to produce a gas, said vessel having an outlet opening located above the level of said heat exchange medium and said carbonaceous material for the discharge of said gas, a gas discharge conduit located in said outlet opening and having a projecting portion that extends along a conduit axis a selected distance into said vessel, and an impingement plate located at the end of said projecting portion of said gas discharge conduit, said impingement plate extending across said outlet opening in spaced relation thereto in a plane substantially transverse to said conduit axis and in the path of said gas, said gas discharge conduit having a first opening formed in an upwardly facing surface portion of said projecting portion thereof and a second, smaller opening formed in a downwardly facing surface portion of said projecting portion, said discharge gas impinging against said plate to separate solids therefrom before flowing through said first opening and through said discharge conduit and any gas-entrained solids passing through said first opening and collecting in said projecting portion draining from said projecting portion through said second opening.

4,199,873

FOLDABLE PANTY HOSE DRYER

Edwin L. Hansen, and Amy L. Hansen, both of Mahomet, Ill., assignors to Veach Development Company, Inc., Los Angeles, Calif.

Filed Jun. 19, 1978, Ser. No. 916,879
Int. Cl.[2] F26B 9/06
U.S. Cl. 34—202 **15 Claims**



1. Apparatus for drying garments, such a women's panty hose, for use with a conventional hand-held hair dryer having an air exhaust nozzle, comprising:

(a) a parallelepiped space enclosed by an even number of like rectangular side walls of sheet material and having a cross section the shape of a regular polygon,

(b) the space being open at one end and adapted to be closed at its other end,

(c) means hingedly connecting all adjacent side walls together in such manner that they may be folded into a flat rectangular stacked configuration of one half the area of the side walls,

(d) a transverse removable perforate flat partition of like material disposed between its opposite ends dividing the space into an air distributing chamber adjacent its closed end and a garment drying chamber adjacent its open end, and

(e) an opening in one side wall communicating with the air distributing chamber adapted to receive an end of said nozzle.

4,199,874

TARGET SIMULATOR

Anatoly A. Koshevoi, Tverskoi Tupik, 9, kv. 62; Mikhail M. Kanaikin, prospect Korneichuka, 7, kv. 201; Viktor J. Lapy, ulitsa Chekistov, 24, kv. 16, and Boris P. Chernov, prospekt 40-letia Oktyabrya, 100, kv. 228, all of Kiev, U.S.S.R.

Filed Dec. 12, 1977, Ser. No. 859,448
Claims priority, application U.S.S.R., Dec. 27, 1976, 2436104[1]
Int. Cl.[2] G01S 9/00
U.S. Cl. 35—10.4 **5 Claims**

1. A simulator of a target which moves in relation to a moving object, comprising:

a synchronization means forming signals corresponding to the variable azimuth of the direction of space scanned by radar installed on the object and to the variable distance of scanned space points, and having first and second outputs;

a group of object transducers forming signals carrying information on the course and speed of said object, and having outputs;

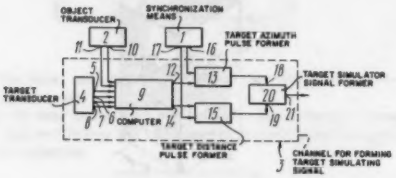
a channel forming a target simulating signal and comprising a group of target transducers, a computer, a target azi-

muth pulse former, a target distance pulse former and a target simulator signal former;

said group of target transducers of said channel forming signals carrying information on the true course and actual speed of said target and the coordinates of the starting point of the target's motion relative to said object, and having first and second outputs;

said computer of said channel having first and second groups of inputs and first and second outputs, said first group of inputs of said computer being connected to said outputs of said group of object transducers, said second group of inputs of said computer being connected to said outputs of said group of target transducers;

said target azimuth pulse former of said channel forming a pulse signal whose timing in relation to a respective reference pulse corresponds to the azimuth of said target, and having a first input electrically connected to said first output of said computer, a second input connected to said first output of said synchronization means, and an output;



said target distance pulse former of said channel forming a pulse signal whose timing in relation to a respective reference pulse corresponds to the distance to the target, and having a first input electrically connected to said second output of said computer, a second input connected to said second output of said synchronization means, and an output; and

said target simulator signal former having a first input connected to said output of said target azimuth signal former, a second input connected to said output of said target distance pulse former, and an output serving as an output of said channel and the output of the target simulator.

4,199,875

VISIBILITY EFFECTS GENERATOR

Joseph Barbarasch, Endwell, N.Y., assignor to The Singer Company, Binghamton, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,743
Int. Cl.[2] G09B 9/08
U.S. Cl. 35—12 N **14 Claims**

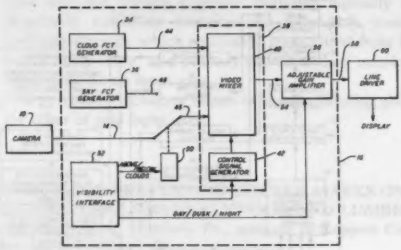
1. Apparatus for use in a special effects generator of a flight simulator visual display system, for producing an output video signal representative of restricted visibility conditions from a first video signal and a cloud signal, comprising:

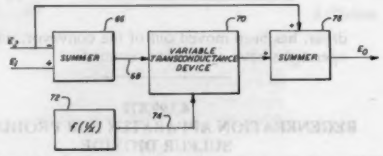
connector means for providing said first video signal and said cloud signal;

first means connected to said connector means for subtracting the cloud signal from the first video signal to produce a difference signal;

second means for providing a control signal which is directly proportional to slant range and inversely proportional to visibility range;

amplifier means including input means to receive said difference signal and said control signal for amplifying said difference signal in response to said control signal to produce an output, said amplifier means operating in a mode such that the gain of the amplifier means is an exponential function of said control signal; and





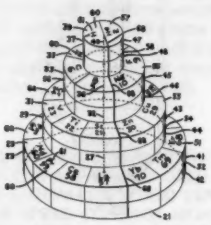
means for adding the cloud signal to the output of the amplifier means to produce an output video signal representative of true atmospheric visibility effects.

4,199,876

DEVICE FOR DISPLAYING AN IMPROVED PERIODIC TABLE OF THE ELEMENTS

Gerson Katz, R.D. 1, Millville, N.J. 08332

Filed Sep. 13, 1978, Ser. No. 942,111
Int. Cl.[2] G09B 23/24
U.S. Cl. 35—18 R **15 Claims**



1. A device for displaying an improved periodic table of the chemical elements, which comprises

a first cylinder having an upper surface and a central axis,

a second cylinder of reduced diameter relative to said first cylinder and having an upper surface and a central axis and being detachably mounted on said upper surface of said first cylinder,

a third cylinder of reduced diameter relative to said second cylinder and having an upper surface and a central axis and being detachably mounted on said upper surface of said second cylinder,

a fourth cylinder of reduced diameter relative to said third cylinder and having an upper surface and a central axis and being detachably mounted on said upper surface of said third cylinder,

said cylinders all being coaxial with said central axis of said first cylinder,

each of said cylinders having an upper cylindrical section and a lower cylindrical section,

each of said cylindrical sections having an upper surface,

each of said upper cylindrical sections being detachably mounted on said upper surfaces of said lower cylindrical sections, and

each of said upper surfaces of said cylindrical sections having a plurality of discrete element sectors containing indicia denoting the chemical elements.

4,199,877

COLOR HARMONY SCALE

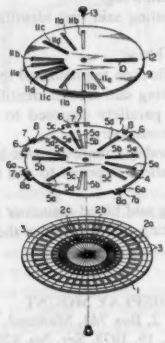
Tatehito Akiyama, Nishinomiya, Japan, assignor to C. Itoh Fashion System Co., Ltd., Osaka, Japan

Filed Mar. 23, 1978, Ser. No. 889,425

Claims priority, application Japan, Apr. 8, 1977, 52-44207[U]

Int. Cl.[2] B44D *2/00*

U.S. Cl. 35—28.3 **7 Claims**



1. A color harmony scale comprising:

a color plate (1) having a plurality of colored members (*2a, 2b* . . .) disposed circularly thereon in sequence along the circumferential direction thereof in accordance with the color harmony principle;

a middle plate (4) placed on top of said color plate (1) and provided with at least two separate sets of angularly spaced windows (*5a, 5b* . . .) through each set of which harmonized colors of a different standard color harmony scheme can be seen on said color plate (1), each set of windows being disposed so as not to interfere with the windows of the other set;

a top plate (9) placed on top of said middle plate (4) and provided with a single base window (10) and a plurality of additional windows (*11a, 11b* . . .), said additional windows (*11a, 11b* . . .) being provided in a predetermined angular relationship with respect to said single base window (10) to form a plurality of sets of windows corresponding to the sets on said middle plate (4) , each set of windows in said top plate (9) including said base window so that only the harmonized colors of one of said standard color harmony schemes can be seen on the color plate (1) when the base window on the top plate (9) is angularly aligned with a selected one of the windows of the set on the middle plate (4) corresponding to said color harmony scheme; and

pivoting means (13) for rotatably securing together said color plate (1), said middle plate (4) and said top plate (9) at the centers thereof.

4,199,878

BALLET AND TOE-DANCE SHOE

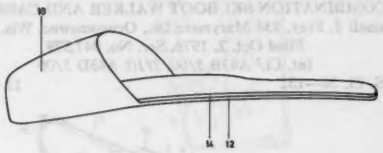
Hugo Wössner, Hauptstr. 28, 7701 Emmingen-Liptingen, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,377

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2736974

Int. Cl.[2] A43B *3/00, 23/00, 13/38*

U.S. Cl. 36—113 **14 Claims**



1. A ballet and toe dance shoe comprising a toe and sole, the toe and sole being integral and made of polyurethane or elastomeric polyester, and stiffening means comprising a plurality of substantially parallel stiffening members running lengthwise connected to the sole.

4,199,879

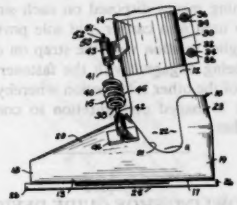
SAFETY SKI BOOT STRUCTURE

Wendell A. Wegeng, 607 Alder, Sandpoint, Id. 83864

Filed Aug. 15, 1978, Ser. No. 933,814

Int. Cl.[2] A43B *5/04*

U.S. Cl. 36—121 **3 Claims**



1. A safety ski boot structure for receiving a skier's foot and lower leg, comprising:

a shoe member for receiving a skier's foot;

a cuff member having a central cuff axis for receiving the skier's lower leg;

an articulating cuff support means operatively interconnecting the shoe member and the cuff member for firmly supporting the cuff member above the shoe member and for enabling the cuff member to be forcibly articulated by the skier's lower leg in four dimensions with respect to the shoe member;

said articulating cuff support means comprises a plurality of helical compression springs mounted in an upright orientation at angularly spaced locations about the cuff axis with upper ends rigidly fixed to the cuff member and lower ends rigidly fixed to the shoe member to prevent the fixed ends from moving with respect to the respective members;

said helical compression springs having intermediate coil sections that are bendable, compressionable and extensible to enable the cuff member to forcibly articulate (1) in a first forward or backward dimension with respect to the shoe member when the skier's lower leg exerts a corresponding forward or backward force of sufficient magnitude to the cuff member, (2) in a second lateral dimension with respect to the shoe member when the skier's lower leg exerts a corresponding lateral force of sufficient magnitude to the cuff member, (3) in a third vertical dimension

with respect to the shoe member when the skier's lower leg exerts a corresponding vertical force of sufficient magnitude to the cuff member, and (4) in a fourth rotational dimension about the central cuff axis with respect to the shoe member when the skier's lower leg exerts a corresponding rotational force of sufficient magnitude to the cuff member to minimize injury to the skier's lower leg.

4,199,880

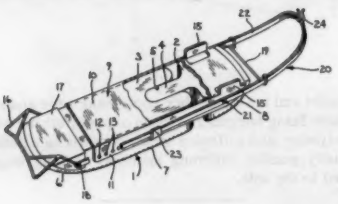
COMBINATION SKI BOOT WALKER AND CARRIER

Russell J. Frey, 934 Marymere Dr., Oconomowoc, Wis. 53066

Filed Oct. 2, 1978, Ser. No. 947,579

Int. Cl.[2] A43B *5/00, 3/10;* A43D *5/00*

U.S. Cl. 36—132 **13 Claims**



1. A combination downhill ski boot walker and boot carrier, comprising a pair of sole portions each having a generally curved lower surface to facilitate walking when used as a walker, attaching means for attaching each sole portion to a ski boot, flexible straps extending along the sides of each sole portion, fastening means disposed on each side of each sole portion, when used as a carrier said sole portions being disposed in engaging relation with the strap on one side of one sole portion being engaged with the fastener on the corresponding side of the other sole portion whereby said straps are in a generally X-shaped configuration to connect said sole portions together.

4,199,881

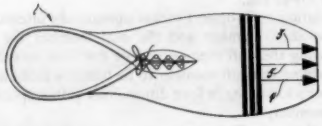
BOWLING SHOE GUIDE DEVICE

Herbert E. Francis, 6135 Cadet St., Detroit, Mich. 48209

Filed Mar. 22, 1978, Ser. No. 889,043

Int. Cl.[2] A43B *5/00*

U.S. Cl. 36—130 **10 Claims**



1. A bowling shoe guide device comprising:

first and second sighting arrow members disposed adjacent the upper forward portion of a bowling shoe;

said first and second sighting arrow members being disposed substantially parallel to the longitudinal axis of said bowling shoe;

the heads of said sighting arrow members being directed towards and terminating adjacent the forward upper tip of said bowling shoe; and said first and second sighting arrow members being relatively spaced apart a distance substantially equal to the standard distance between a pair of adjacent crevices defined between the longitudinal boards which form the floor of a conventional bowling alley.

4,199,882

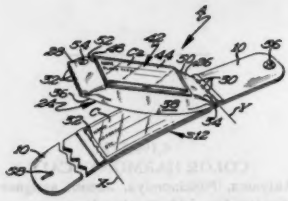
PERSON AND BLOOD IDENTIFICATION WRIST BAND

Ralph V. Clayman, 716-13th Ave. SE., Minneapolis, Minn. 55414

Filed Jun. 2, 1978, Ser. No. 911,714

Int. Cl.[2] G09F *3/02*

U.S. Cl. 40—21 C **7 Claims**



1. A device for identification of a person and his related blood sample comprising:

(a) a support,

(b) a first identification tag,

(c) means for mounting said first identification tag on said support,

(d) a container for blood,

(e) a second identification tag identical to said first tag,

(f) means for mounting said second identification tag on said blood container parallely disposed to and in alignment with said blood container,

(g) means for removably connecting said blood container on said support parallely disposed to and in alignment with said first tag,

(h) means for filling said blood container with blood, and

(i) means for mounting said support on the person of a user.

4,199,883

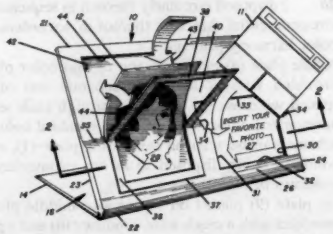
DISPLAY MOUNT

Carroll N. Cross, Rte. 2, Box 741, Maitland, Fla. 32751

Filed Jan. 19, 1978, Ser. No. 870,745

Int. Cl.[2] G09F *1/12*

U.S. Cl. 40—152.1 **6 Claims**



1. A display mount comprising in combination:

a generally rectangular back panel, an adjacent intermediate spacing panel substantially the same size as said back panel, and a face panel having an area substantially smaller than said adjacent back and intermediate panels, adjacent to said intermediate panel and located adjacent three edges thereof;

flexible binding means secured to the front exposed area of said face panel and intermediate panel;

means for holding said back panel, intermediate panel, and facing panel together about the edges thereof, said means including binding said face panel to the front of said intermediate panel;

an aperture extending through the front area of said display

mount through a portion of the face panel and the intermediate panel, said smaller face panel having three edges facing said aperture and said intermediate panel having four edges with each face panel of the aperture overlapping the corresponding edges of said intermediate panel to form pockets with an intermediate spacing from the back panel for holding sheet material or the like inserted in the pocket whereby two levels are formed on the front area of said display mount intersecting the aperture in the front area thereof.

4,199,884

MARKING SLEEVE FOR WIRES

Nils O. T. Lööf, Gullspång, Sweden

Continuation of Ser. No. 710,933, Aug. 2, 1976, abandoned. This application Dec. 8, 1977, Ser. No. 858,591
Claims priority, application Sweden, Aug. 13, 1975, 7509060
Int. Cl.[2] G09F *3/04*
U.S. Cl. 40—316 **2 Claims**

1. A marker suitable for application on thin electrical wires and the like,

said marker consisting of a deformable tubular body extruded from a flexible plastic material and closed in a circumferential direction, and

comprising in an undeformed condition, a first portion of substantially arcuate cross-section with a circular inner wall extending through an angle substantially greater than 180° so that the inner wall corresponds to substantially more than ½ the circumference of a thinnest wire in a range of thicknesses to which said marker is applicable and a second portion which is integral with the first portion and comprises two flange-like projections extending approximately radially outwardly from the first portion and interconnected at their outer ends, at least one of said projections carrying visible indicia,

said marker being capable of application on wires having a range of thicknesses, said first portion having said inner wall extending along at least half the circumference of the thinnest wire in said range, so that when the marker is mounted on such a wire, said two flange-like projections are substantially parallel and said inner wall serves to retain said marker on said wire, and in a deformed condition, said arcuate portion and said flange-like projections being deformed so as to together form a sleeve of circular cross-section surrounding the thickest wire in said range.

4,199,885

ILLUMINATED SIGN AND LAMP BOX ASSEMBLY

Edward F. Sherwood, Gettysburg, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 27, 1978, Ser. No. 928,638
Int. Cl.[2] G09F *23/00*
U.S. Cl. 40—568 **3 Claims**

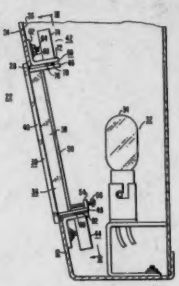
1. A sign, comprising:

a panel having front and back sides and an opening therebetween,

permanent magnet means mounted adjacent to said opening, on the backside of said panel,

and a lens assembly in said opening which includes magnetic material positioned to be attracted to said permanent magnet means by a force which maintains said lens assembly in the opening,

said lens assembly being removable from the front side of



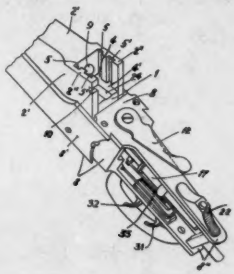
said panel, by overcoming the attractive force between said permanent magnet means and said magnetic material, said lens assembly including a message plate, and adjustable means for holding said message plate in the lens assembly.

4,199,886

GUNS

Albert Deuring, Maurachgasse 14, A-6900 Bregenz, Austria

Filed Apr. 21, 1978, Ser. No. 898,562
Claims priority, application Switzerland, Apr. 26, 1977, 5184/77
Int. Cl.[2] F41C *11/08*
U.S. Cl. 42—44 **7 Claims**



1. A gun having a lock housing and a barrel pivotable relative to the lock housing, a fork piece on the barrel, and a locking block adjacent the end of the bore of the barrel, the fork piece and locking block being provided with interengaging and mutually adapted locking means which are in sliding engagement with one another and which comprise forward ribs and matching grooves of prismatic form and rear ribs and matching grooves of dovetail form.

4,199,887

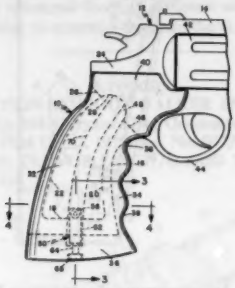
ONE PIECE HAND GRIP FOR PISTOL

Guy Hogue, 14540 Old Morro Rd., Atascadero, Calif. 93422

Continuation of Ser. No. 836,156, Sep. 23, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 954,205
Int. Cl.[2] F41C *23/00*
U.S. Cl. 42—71 P **8 Claims**

1. A one piece hand grip for a pistol having a frame with a hand receiving butt, the butt having a front portion, a rear portion and a lower interconnecting foot, the upper end of the butt having a thickened portion defining shoulders in the frame, the hand grip comprising:

a unitary grip member having a pair of sides, an interconnecting front portion and an interconnecting lower shoe, said grip being internally shaped to fit closely over said butt enclosing the sides and front thereof, with said shoe seated against the foot;



fastener means extending through said shoe and engaging said foot to secure the grip with an upward clamping action against the foot;

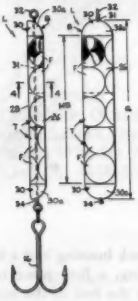
and said fastener means includes yoke means straddling the foot and having a cross bar portion below the foot, and a fastener extending through said shoe and connected to said cross bar portion.

4,199,888

COMBINED SINKER AND FISHING LURE

Gary D. Barnes, 611 Hermitage St., San Jose, Calif. 95134

Filed Apr. 13, 1978, Ser. No. 895,861
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.33 **12 Claims**



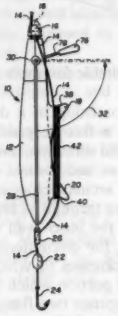
1. A combined sinker and fishing lure for deep water fishing, said lure comprising a heavy elongate molded lead body which acts as a sinker, said body having a major body portion having a peripheral surface that extends substantially the full length of the lure and short end portions integral with said major body portion, said major body portion having a substantially semicylindrical sidewall that is substantially fully semicircular in cross-section and a single opposed, substantially flat sidewall that intersects said substantially semicylindrical sidewall, said sidewalls both being longitudinally straight along the length of said major body portion, the cross-sectional shape of said major body portion being of substantially uniform size along its length, said end portions having rounded surfaces that merge with said semicylindrical sidewall and intersect said flat sidewall, eyelets projecting from the end portions of said body, one for connection to a fishing line and the other for connection to a fish hook, said eyelets are formed of a double strand of wire enbedded in the molded lead body and extending along the entire length of the body, said double strand being closely twisted between the eyelets, the peripheral surface of said major body portion having adhered thereto along a substantial portion of its length a reflecting tape, said tape comprising a transparent plastic outer layer, and a thin, highly reflective metallic intermediate layer and an inner layer of adhesive, said reflective layer of the tape being formed with an array of light diffraction figures with each figure being formed of substantially parallel light diffraction grooves, there being at least several thousand grooves per diametral inch of each figure for producing an iridescent rainbow play of colors when immersed in water that receives sunlight.

4,199,889

FISHING FLOAT

Lawrence Van Orden, Berkshire Valley Rd., Milton, Oak Ridge, and David G. Wilson, Moosepac La., Oak Ridge, both of N.J. 07438

Filed Jun. 2, 1978, Ser. No. 911,781
Int. Cl.[2] A01K *93/00*
U.S. Cl. 43—43.11 **10 Claims**



1. Fishing equipment including in combination a float for connection with a line from a reel on a fishing rod, a guide on the float through which the line passes, spaced surfaces extending from the bottom of the float and facing in different directions from one another so that slack in the line beyond the guide can be wrapped in loops from one of said surfaces to the other, areas of the spaced surfaces diverging from one another in a downward direction when the float is floating in the water with the said surfaces horizontally spaced from one another, the angle of divergence being sufficient to cause each loop that is wrapped around the spaced surfaces to remain in place until a next loop below them has unwound from said spaced surfaces and provided slack to the next loop above sufficient to permit said next loop above to slide over the lower ends of the diverging surfaces, characterized by a line guide through which the line passes at a location between the loops that are wrapped on the spaced surfaces and a bait on the fishing line, said line guide being in position to hold the line beyond the loops on the surfaces about which they are wrapped during casting of the bait and float and further characterized by a control guide arm having a substantial length parallel to a longitudinal axis of the float during casting of the float and bait, the control guide arm having a pivotal connection to the float at one end thereof and the line guide being connected to the control guide arm at a location spaced from said pivot connection.

4,199,890
FISHING LINE RELEASE DEVICE

Milton Austin, 3 Spielman Rd., Fairfield, N.J. 07006, and Arthur G. Kendall, 37 Passaic Ave., Livingston, N.J. 07039

Filed Mar. 2, 1978, Ser. No. 882,672
Int. Cl.² A01K 91/06
U.S. Cl. 43—43.12 5 Claims

1. A fishing line release device comprising:

a line release housing comprising a pair of substantially disk-shaped shell members, said shell members possessing convex outer surfaces and concave inner surfaces lying in juxtaposition to each other, said shell members defining a hollow body therebetween, recessed sections on said shell members, and a pair of axially aligned cylindrical hub portions adjacent and centrally disposed in fixed position within respective shell members, each of said hub portions having a bore located centrally therein, one of said bores comprising a screw-threaded bore;

a fishing line retainer comprising a circular base ring adapted for rotatable, seated, annular engagement with at least one of said hub portions, and an arm integral at one end with said base ring and radially extending therefrom, said arm defining at the free end thereof a hook-shaped member;

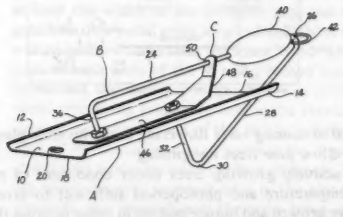
at least two rod-shaped, fixed stop members integral with said inner surfaces of said shell members for controlling the rotation of said arm about said hub portions; and

an adjustable locking means comprising a screw-threaded shaft adapted to mate with complementary threads provided within said screw-threaded bore, means for rotating said shaft within said bore for axially reciprocating said shell members with respect to each other, and a linearly aligned adjustable stop member on the inner surface of one of said shell members, said adjustable stop member serving to retain said arm within an adjustable space defined by said adjustable stop member and one of said fixed stop members.

4,199,891
STABILIZED TROLLING PLANER

Walter H. Davis, 1222 Maiden La., Columbia, S.C. 29205

Filed Apr. 24, 1978, Ser. No. 899,307
Int. Cl.² A01K 91/06
U.S. Cl. 43—43.13 9 Claims

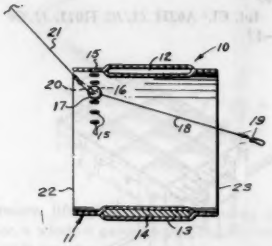


4. In a trolling planer of the type having a planing body, a wire frame connected to said planing body adapted for connection to a fishing line, a weight positioned on said wire frame, said wire frame having an angular configuration including two free legs affixed to said planing body at two longitudinally spaced points, and means affixing said free legs to said planing body, the improvement comprising an elongated brace member extending longitudinally along the longitudinal axis of said planing body, said brace member interconnecting said planing body and said wire frame affording restraint against twisting movement therebetween.

4,199,892
FISHING LINE GUIDING DEVICE

Lewis G. Reeves, 121 Todd Dr., Bethany Beach, Del. 19930

Filed Jun. 26, 1978, Ser. No. 919,031
Int. Cl.² A01K 97/00
U.S. Cl. 43—43.13 2 Claims

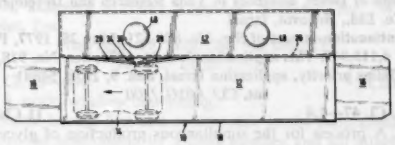


1. A fishing line guiding device, comprising, in combination, a hollow cylinder having a central opening extending axially therethrough, an axially extending elongated weight along a side of said cylinder, and an elongated airspace chamber formed along a diametrically opposite side of said cylinder, a plurality of slot-shaped openings through a wall of said cylinder arranged in a row extending a part way around said cylinder and located near one end thereof, and a fishing line assembly adjustably attachable to said cylinder by a selection of said openings.

4,199,893
APPARATUS FOR BRAKING AND STARTING SPRING-DRIVEN CARS

Herbert Rittinger, Blumberg, Fed. Rep. of Germany, assignor to Helmut Darda Spielwaren und Maschinenbau GmbH Im Tal, Blumberg, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 950,308
Claims priority, application Fed. Rep. of Germany, Feb. 7, 1978, 7803533
Int. Cl.² A63H 17/42
U.S. Cl. 46—1 K 16 Claims



1. An apparatus for starting spring-driven toy cars having a housing; said housing being formed of a fitted base plate having a width equal to that of the car and vertical side walls in which at least one of said side walls has at least one portion which is pivotable partially inward over said base plate; wherein: said one side wall (20) is provided with a braking bar (22) disposed parallel to said base plate (12) at a level of the upper area of a wheel of a car adapted to traverse said base plate; said braking-bar (22) being pivotable inwardly at one part of its length against a tension-spring at the level of the side wall; and lock-

ing-means (46), (48), (50) associated with said housing and movable with respect to said side wall between two positions, said locking means being adapted to release the braking-bar in one position and hold the braking-bar in place pivoted inwardly over said base plate in the other position.

4,199,894

TOY MODEL KIT INCLUDING A SOLAR COLLECTOR

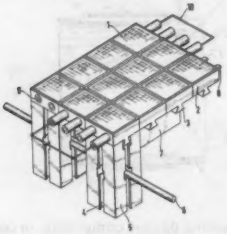
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 923,640

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737443

Int. Cl.[2] A63H *33/10*; H01L *31/04*

U.S. Cl. 46—17 16 Claims



1. In a toy model assembled from structural elements of a kit, comprising a solar collector having a supporting member; at least one solar cell mounted on said supporting member; electrical connecting means arranged on said supporting member for electrically connecting said at least one solar cell with other solar cells; and mechanical connecting means also arranged on said supporting member so as to connect the latter to another structural element of the toy model, so that said supporting member and said at least one solar cell together form an integral part of the toy model.

4,199,895

PRODUCTION OF GLYCEROL, CAROTENES AND ALGAE MEAL

Mordhay Avron, Rehovot, and Ami Ben-Amotz, Ramat Gan, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 800,521, May 25, 1977, Pat. No. 4,115,949. This application Jun. 26, 1978, Ser. No. 918,802

Claims priority, application Israel, Jun. 9, 1978, 54881

Int. Cl.[2] A01G *7/00*

U.S. Cl. 47—1.4 11 Claims

1. A process for the simultaneous production of glycerol, carotenes and protein-rich material which comprises cultivating algae of the *Dunaliella bardawil* species under high-intensity illumination in a growth medium containing an amount sufficient of nutrients including nitrogen to effect growth of said algae and a high concentration of sodium chloride which reaches at least 1.5 M in the final stage of the cultivation, providing an adequate supply of carbon, in a depth of not exceeding 20 cm of the aqueous medium, in a diurnal cycle of illumination, until algae of high content of the above three components are obtained, harvesting the algae and recovering from same the three constituents.

4,199,896

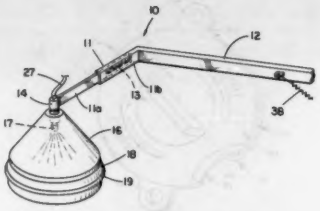
CONTROLLED AREA BOOM SPRAYER

Verne E. Lehman, 2917 Sycamore La., Donnybrook, Bremen, Ind. 46506

Filed Jun. 22, 1978, Ser. No. 918,161

Int. Cl.[2] A01C *23/04*

U.S. Cl. 47—1.7 2 Claims



1. A boom type spraying apparatus adapted to be moved parallel to a row of vegetation and to deposit a sprayed liquid on a targeted area adjacent the row while preventing the sprayed liquid from reaching the vegetation itself, said apparatus comprising a boom arm having telescoping portions permitting variation in the length of the boom but resiliently biased to maximum length position, means for supporting and moving the boom at one of its ends and a spray nozzle carried at the other end of the boom, a bell-shaped hood carried by the boom encircling said spray nozzle and free to rotate about its central axis with relation to the boom and nozzle, the outer marginal area of the hood being adapted to engage the vegetation and rotate about its central axis as the boom is moved along the row of vegetation with variations in the length of the boom accomodating irregularities in the contour of the vegetation row, said outer marginal area of the hood being provided with sensing means operable to control the flow of liquid to the nozzle to permit deposit of the sprayed liquid only when said hood engages the vegetation.

4,199,897

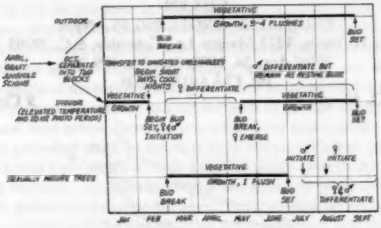
METHOD FOR INDUCING EARLY FLOWERING ON YOUNG FOREST TREES

Michael S. Greenwood, Hot Springs, Ark., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 30, 1978, Ser. No. 910,990

Int. Cl.[2] A01H *1/00*

U.S. Cl. 47—58 7 Claims



1. A method of causing early flowering in the juvenile phase of southern yellow pine trees comprising:

a. placing actively growing trees under conditions of reduced temperature and photoperiod sufficient to arrest said active growth and induce bud set in order to bring the trees into a resting state,

b. providing an environment for the resting trees in which the temperature and photoperiod conditions would favor

vegetative growth so as to allow male and female sexual buds to form during the resting period, and

c. maintaining the trees in said environment so that male and female strobili flush and the trees resume natural growth.

4,199,898

CLOSURE APPARATUS WITH SNAP-IN SEAL STRIPS

Peter J. Connor, Bethlehem, Pa., assignor to Mosser Industries, Inc., Bethlehem, Pa.

Filed Mar. 26, 1979, Ser. No. 24,073
Int. Cl.[2] E06B 7/098
U.S. Cl. 49—92 18 Claims

1. A closure apparatus comprising

a frame, a portion of which has a linear edge with a flat border;

a moving member carried by the frame, the moving member also having a linear edge with a flat border, said moving member being operable to be moved into a closed position with respect to the frame, in which closed position an elongate gap exists between the two linear edges;

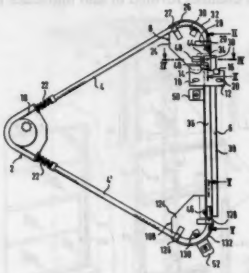
and means for sealing the gap between the two linear edges, said sealing means comprising (a) means forming a first crevice-like channel fixed to the moving member at its linear edge and extending along said edge, the plane of the channel being substantially parallel to the flat border of said edge, and the opening of the channel facing away from the moving member and toward said elongate gap; (b) means forming a second crevice-like channel connected to the first channel, the second channel generally facing, being parallel to, and in substantially the same plane as, the first channel, but spaced apart therefrom by at least the width of the elongate gap; and (c) an elongated, flexible metal strip, longitudinally bent so as to have a cross-section shaped like the letter V, but with the upper ends of both arms of the V being turned outward to the horizontal, thus creating longitudinal lips on the strip, said metal strip being releasably held in the crevice-like channels by insertion of one of the strip's longitudinal lips in each of the channels so as to position the V portion of the strip in the space between the two channels, the V pointing approximately perpendicular to the plane of the two channels, the channels and the strip being so positioned that the strip's surface which faces away from the moving member will be in sealing contact with the linear edge of the frame when in the closed position.

4,199,899

WINDOW LIFTING MECHANISM

Günter Mühling, and Hans-Peter Hess, both of Coburg, Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed Aug. 22, 1978, Ser. No. 936,571
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738672
Int. Cl.[2] E05F 11/48
U.S. Cl. 49—352 9 Claims



1. In a window lifting mechanism including an elongated guide member, a window carrier member longitudinally movable on the guide member, two connectors connecting respective longitudinal end portions of said guide member to two associated tubular casing sections, two longitudinally terminal portions of at least one elongated tension member being fastened to said window carrier member and extending therefrom into said casing sections respectively, and drive means for longitudinally moving said at least one tension member relative to said guide member and for thereby moving said carrier member, the improvement in at least one of said connectors which consists in said connector being a unitary piece of sheet metal, respective parts of said piece constituting a substantially planar main portion of said one connector and guide and fastening elements angularly offset from said main portion for engagement with the casing section associated with said one connector for fastening said casing section to said guide member in a position in which said casing section defines therein an arcuate path of movement for the corresponding terminal portion of said at least one tension member, said planar main portion being located along the portion of said casing section defining said arcuate path of movement.

4,199,900

STORM WINDOW UNIT

Bobby M. Johnston, Dallas, and Billy C. Pope, Garland, both of Tex., assignors to Talco Aluminum Company, Inc., Wills Point, Tex.

Filed Mar. 27, 1978, Ser. No. 890,413
Int. Cl.[2] E05D 15/06
U.S. Cl. 49—404 3 Claims

1. A storm window comprising:

a frame having first and second side jambs maintained in spaced relationship by a head member and sill attached between the first and second side jambs,

sealing flanges extending interiorly from the side jambs and the head member, said sealing flanges being coplanar one with the other,

a midbrace attached between said side jambs intermediate of said head member and sill, said midbrace including a sealing flange in the plane of said sealing flanges extending from said side jambs and said head member,

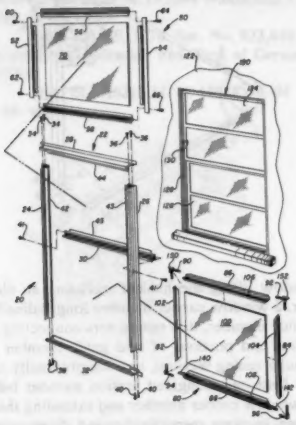
a first glass unit for engagement in said frame having a sealing surface around the entire periphery thereof in substantially a common plane for sealing engagement of

the entire periphery against the sealing flanges of said head member, said side jambs and said midbrace,

a second glass unit for engagement in said frame having a sealing surface around the periphery thereof in substantially a common plane for sealing engagement against the sealing flanges of said midbrace and said side jambs,

a first channel formed in the head member having the sealing flange extending from the head member as one leg of said first channel, said channel opening interiorly towards said midbrace for receiving the top edge of said first glass unit,

a second channel formed in said midbrace having the sealing



flange extending from the midbrace as one leg of said second channel, said second channel opening toward said head member for receiving the bottom edge of said first glass unit,

a second midbrace flange extending upwardly from said midbrace toward said first channel and spaced from the legs of said second channel, and

a flange extending downwardly from the bottom edge of said first glass unit and overlying said second midbrace flange toward the side of said second midbrace flange remote from said sealing flange extending from said midbrace.

4,199,901

GRINDING MACHINE

Francois C. Lefevre, La Chauprillade, Paslieres 63290 Puy-Guillaume, France

Filed Jun. 30, 1978, Ser. No. 920,971

Claims priority, application France, Jul. 8, 1977, 77 22003

Int. Cl.[2] B24B *3/40*

U.S. Cl. 51—83 BS **7 Claims**

1. A machine for grinding, such as for sharpening knives comprising:

a first part,

a second part,

means for mounting the second part on the first part for linear and rotational movement relative thereto,

means for moving the second part relative to said first part,

grinding wheels,

means for mounting said grinding wheels on one said part in substantially coplanar relation,

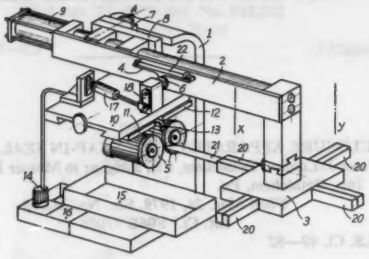
article holding means,

means for mounting said article holding means on the other said part,

a template,

means mounting said template on the other said part,

a contact sensor engaging said template, and



means mounting said contact sensor on said one part with the point of engagement thereof with said template lying substantially in the plane of said grinding wheels.

4,199,902

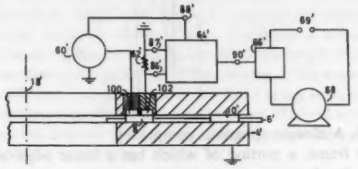
APPARATUS FOR AUTOMATIC LAPPING CONTROL

Franz L. Sauerland, 2851 Southington Rd., Shaker Heights, Ohio 44120

Continuation-in-part of Ser. No. 924,884, Jul. 17, 1978. This application Feb. 9, 1979, Ser. No. 10,983

Int. Cl.[2] B24B *49/04*

U.S. Cl. 51—165 R **6 Claims**



1. Control apparatus for a machine for lapping wafers, having at least one piezoelectric wafer, comprising:

a. at least a first and second electrode means in and isolated from said lapping plate, said first and second electrode means being spaced in close proximity to each other and being faced with a solid dielectric material with a relative dielectric constant larger than 10 and positionable toward the lapping surface;

b. means for sensing the resonance frequency of piezoelectric wafers and means for terminating lapping when said resonance frequency reaches a predetermined relationship with a target frequency.

4,199,903

EXPANDABLE ABRADING TOOL AND ABRASIVE INSERT THEREOF

Paul Fitzpatrick, Southfield, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

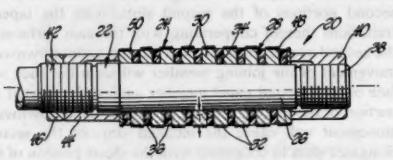
Filed Apr. 19, 1978, Ser. No. 897,626

Int. Cl.[2] B24D *9/00*

U.S. Cl. 51—339 **3 Claims**

1. An abrading tool comprising: a tapered arbor having a central rotational axis and an outer surface of a frustoconical shape; the arbor having a smaller leading end including a threaded portion and a larger trailing end including a threaded portion; the leading end of the arbor also including an axially extending slot; an abrasive insert mounted on the arbor between the threaded portions thereof; said insert including a metallic helical element having a plurality of coils wound about the arbor; an outer abrasive strip on the coils for performing a machining operation; the insert also including a

helical spacer wound about the arbor between the coils of the helical element so as to space the abrasive strip on each coil thereof from the abrasive strip on the adjacent coils thereof while concomitantly preventing movement of the coils toward each other; the insert having leading and trailing tapered ends; the tapered leading end of the insert including an end coil having an inwardly bent end portion received within the axially extending slot of the arbor in order to prevent rotation of the insert on the arbor; and positioning nuts received by the



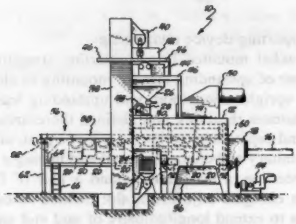
threaded portions of the arbor and engaged axially with the ends of the insert to provide axial positioning thereof along the arbor such that nut rotation can move the insert along the arbor to control the diameter of each coil of the helical element in order to initially size the insert and to subsequently compensate for wear of the abrasive strip, and the bent end portion of the leading end of the insert sliding axially within the slot in the arbor to permit axial movement of the insert on the arbor as the diameter adjustment of the insert takes place.

4,199,904

RETRACTABLE BLAST WHEEL CARRIER

Gary L. Shoup, Greencastle, Pa., and Jack B. Grier, Hagerstown, Md., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 2, 1977, Ser. No. 856,934
Int. Cl.² B24C *3/30*
U.S. Cl. 51—423 **7 Claims**



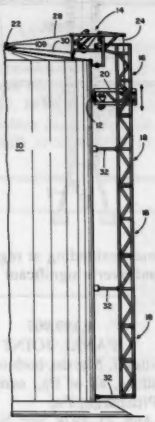
1. A blast wheel carrier apparatus in combination with a blast cabinet and a blast drum, track means having a first end portion fixedly mounted in said blast cabinet and a second end portion fixedly mounted outside of said blast cabinet; hanger means depending from said track means and including means for moving said hanger means between said first end portion and said second end portion of said track means; throwing wheel means carried by said hanger means, means securing said throwing wheel means to said hanger means for movement therewith between said first end portion and said second end portion of said track means; and means mounting said blast drum for rotation inside of said blast cabinet and around said first end portion of said track means and said throwing wheel means.

4,199,905

BLAST HEAD RIGGING APPARATUS FOR TANK SIDE CLEANING

Robert J. Neidigh, Breman, and Harvey G. Van Fossen, Mishawaka, both of Ind., assignors to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Sep. 11, 1978, Ser. No. 940,958
Int. Cl.² B24C *1/00, 3/06*
U.S. Cl. 51—429 **11 Claims**



1. A rigging apparatus for use in treating the side of a storage tank with a blasting device comprising:

(a) a wheeled travel car including winch means connectable to the top of said tank for pulling said travel car up the side of the tank and positioning the car on the top along the outer periphery thereof,

(b) drive means for selectably moving the car along the tank top periphery,

(c) a rigging suspended from said travel car in a position adjacent said tank side,

(d) frame means vertically displaceable on said rigging for securing said blasting device in contact with said tank side, said frame means being suspended from said winch means, the latter controlling the vertical movement of the former relative to said rigging.

4,199,906

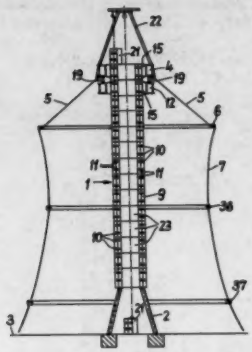
COOLING TOWER

Erich Jasch, Seeheim, and Paul Kasper, St. Wendel, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Nov. 6, 1978, Ser. No. 957,840
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749349
Int. Cl.² E04B *1/35;* E05H *5/12;* E04H *12/00*
U.S. Cl. 52—63 **20 Claims**

1. In a cooling tower including a jacket composed of a non-self-supporting shell, a spacer ring and a ground support between which the shell is stretched, a mast composed at least in part of a metallic material, a main lifting ring attached to the mast, and cables connected between the spacer ring and the main lifting ring for supporting the spacer via the main lifting ring, the improvement comprising an auxiliary lifting ring attached to said mast, and wherein said mast, said main lifting ring and said auxiliary lifting ring are each provided with a

row of spaced bores, with the bores of each said lifting ring being located adjacent the respective bores of said mast, and



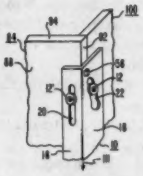
the bores of said mast extending at regular intervals from the top of said mast and over a significant portion of its height.

4,199,907

PANEL JOINT

Gurdip S. Bains; Niles J. Martin, both of Bonneville, and Leigh F. Jackson, Guilford, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 23, 1978, Ser. No. 936,298
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—125 **5 Claims**



1. A panel joint, comprising:

first and second non metallic upstanding panel members having front and back surfaces, and vertically extending side portions, said first and second panel members being arranged at right angles, with selected vertical side portions adjoining one another, with the back surfaces of the panels on the outside of the right angle configuration,

a plurality of first spacer members having head and shank portions, said first spacer members being fixed to the back surface of said first panel member, in spaced relation with one another along the side portion which adjoins the second panel member, with their head portions spaced from the back surfaces of the first panel member,

a plurality of second spacer members having head and shank portions, and a tapered cam surface which tapers inwardly from the head portion to the shank portion, said second spacer members being immovably fixed to the back surface of said second panel member, in spaced relation with one another, and adjacent to the side portion which adjoins the first panel member, and

an elongated right angle joining member having first and second leg portions which define a corner portion at their intersection,

said first leg portion having a plurality of spaced elongated first slots, the sides of which are parallel with the corner portion,

said second leg portion having a plurality of spaced elongated second slots, with each of said second slots including a first portion having sides which are parallel with one another but inclined relative to the corner portion, an enlarged spacer head receiving portion, and a third portion which defines a tapered transition between the first and second portions,

said plurality of first spacer member extending through the plurality of first slots such that said joining member is captured by, but vertically slidable relative to, said first panel member,

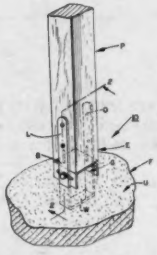
said head portions of the second spacer members being insertable through the enlarged spacer head receiving second portions of the second slots, with the tapered transitions thereof cooperating with the cam surfaces of the second spacer member such that an initial downward movement of the joining member will cam the back surface of said second panel member against the second leg portion of the joining member, and continued downward movement will cause the inclined slots of the second elongated slots to cooperate with the shank portion of the second spacer members to force the first and second panel members tightly together.

4,199,908

POST BASE ELEVATOR

Darrel L. Teeters, 12146 Fourth St., Yucaipa, Calif. 92399

Filed Aug. 1, 1978, Ser. No. 930,043
Int. Cl.[2] E04H *12/22*
U.S. Cl. 52—295 **10 Claims**



1. A post supporting device comprising:

a support bracket mounted in a supporting structure and having a pair of upstanding legs for mounting an elongate post in an upright orientation, said upstanding legs each having a fastener receiving hole defined therethrough;

an elongate end cap connected to one end of a post, said end cap being unitary and channel-shaped and having a longitudinal centerline, a base portion and a pair of flanges thereon, an elongate adjustment slot defined in each of said flanges to extend longitudinally of said end cap and positioned between said base portion and a terminal edge of said each flange so that each slot is in alignment with each of said bracket fastener receiving holes;

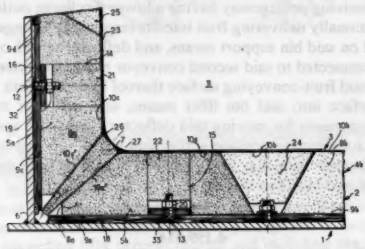
first fastening means attaching said end cap base portion to one end of a post; and

second fastening means located in said aligned slots and bracket fastener receiving holes attaching said end cap to said bracket and thereby attaching a post to said bracket, said end cap flanges contacting a surface of said supporting structure to maintain a predetermined spacing between said post lower end and said surface, said slots permitting movement of said end cap with respect to said support bracket in a direction transverse to the longitudinal centerline of the upright elongate post while said predetermined spacing is maintained.

4,199,909
THERMALLY INSULATING, FLUID-TIGHT COMPOSITE WALL, PREFABRICATED ELEMENTS FOR CONSTRUCTING THE SAME AND METHOD OF CONSTRUCTING SAID WALL

Michel Kotcharian, Paris, France, assignor to Technigaz, France

Filed Apr. 4, 1978, Ser. No. 893,531
Claims priority, application France, Apr. 7, 1977, 77 10610; Mar. 30, 1978, 78 09299
Int. Cl.[2] E04B 1/62
U.S. Cl. 52—410 24 Claims

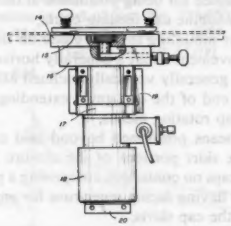


1. A thermally insulating, fluid-tight composite wall, which comprises successively, from the exterior to the interior, a self-supporting external wall; an initially deformable and subsequently hardenable packing material which is placed on said self-supporting external wall in deformable state and is thereafter hardened; a bed of thermally insulating elements placed on said packing material while the latter is still in deformable state so that the entire space between said self-supporting wall and said thermally insulating elements is filled by said packing material, and said bed is at least partially fastened to said self-supporting wall after hardening of said packing material, said thermally insulating elements defining between themselves joints wherein joining members are located and which join said thermally insulating elements; and a fluid-tight internal lining, forming a primary barrier, of a flexible laminated material offering mechanical strength and cold resistence.

4,199,910
T-SHAPED EDGE FINISHING STRIPS AND THEIR PRODUCTION

Alfred J. Priore, 73 Taylor St., Dedham, Mass. 02026

Filed Aug. 23, 1978, Ser. No. 936,013
Int. Cl.[2] E04F 19/02
U.S. Cl. 52—716 4 Claims

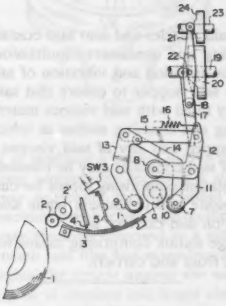


1. A flexible T-shaped finishing strip comprising an anchoring tongue and a head, said tongue extending from end-to-end of said head and insertable in a slot extending lengthwise of the edge of the woodwork and said head shaped and dimensioned to establish a finishing face for said edge when the tongue is thus anchored, said tongue including a series of relatively long and narrow fingers extending from its free edge substantially to the junction of said tongue with said head, all of said fingers parallel and disposed diagonally of said junction with their centers spaced therealong and with their ends uniformly offset and with the opposite sides of said ends overlapping and in mutual contact thus providing for sliding engagement of said fingers as said strip is curved to conform to an inside radius and presenting a substantially continuous surface when the strip is straight, said fingers being spread apart as required when the strip is bent to conform to an outside radius, and the lay of said fingers such that the maximum thickness of the tongue is about twice that of the fingers.

4,199,911
COIN PACKAGING MACHINE

Yorizo Miyazaki, and Katusuke Furuya, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1978, Ser. No. 963,679
Claims priority, application Japan, Nov. 28, 1977, 52-142428
Int. Cl.[2] B65B 57/06, 57/08, 11/04
U.S. Cl. 53—64 3 Claims



2. A coin packaging machine wherein accumulated coins are packaged with a supplied packaging paper by a plurality of packaging rollers which are moved by a packaging motor between a first position in which the accumulated coins are introduced among the packaging rollers and not gripped thereby and a second position in which the accumulated coins are gripped and wound with the packaging paper by the packaging rollers, characterized in that a paper detecting means is provided for detecting the presence of the packaging paper fed to the packaging rollers and a circuit means connected to the paper detecting means is constructed to reversely rotate the packaging motor so as to move the packaging rollers from substantially said second position to said first position and make the stoppings of the packaging motor and the machine in response to non-presence of the packaging paper sensed by the paper detecting means.

4,199,912
METHOD AND APPARATUS FOR FILLING CONTAINERS WITH A RELATIVELY VISCOUS MATERIAL

Forrest H. James, Jr., and Ira J. Silberman, both of Opelika, Ala., assignors to Diversified Products Corporation, Opelika, Ala.

Division of Ser. No. 843,267, Oct. 18, 1977. This application Oct. 10, 1978, Ser. No. 950,060
Int. Cl.[2] B65B 7/28, 63/08
U.S. Cl. 53—127 6 Claims

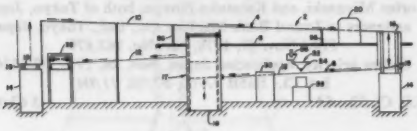
1. An apparatus for filling a plurality of containers with a relatively viscous material, each of said containers having a filling opening in the periphery thereof, comprising:

(a) conveying means for transporting said containers through a plurality of stations, said conveying means including a plurality of carriers each of which supports at

least one of said containers thereon with said opening therein oriented upwardly;

(b) a lubricating station comprising means for lubricating the exterior of said containers prior to said containers receiving said viscous material therein to facilitate subsequent cleaning thereof;

(c) a filling station comprising a dispensing hopper for holding a supply of said viscous material, a plurality of nozzles in fluid flow communication with said hopper for directing said viscous material into said containers through said openings, means for simultaneously agitating and vibrating said viscous material inside said hopper to induce a uniform and continuous flow thereof from said hopper



through said nozzles and into said containers, and means for vibrating said containers simultaneously with the simultaneous agitation and vibration of said viscous material inside said hopper to ensure that said containers are completely filled with said viscous material;

(d) a capping and cleaning station at which said openings may be capped and any of said viscous material on the exterior of said container may be cleaned therefrom;

(e) a curing station comprising means for curing said viscous material inside said containers while said containers are supported on said carriers; and

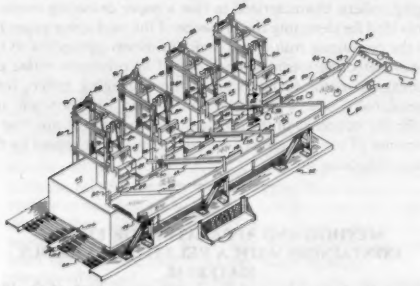
(f) a discharge station comprising means for removing said containers from said carriers.

4,199,913

ORCHARD FRUIT HANDLING SYSTEM

Clarence E. Hood; Carl M. McHugh, both of Clemson, S.C., and Fletcher G. Hawkins, Crossville, Tenn., assignors to Clemson University, Clemson, S.C.

Filed Dec. 5, 1978, Ser. No. 966,618
Int. Cl.[2] B65B *1/06;* **A01D** *61/02, 46/22*
U.S. Cl. 53—244 **9 Claims**



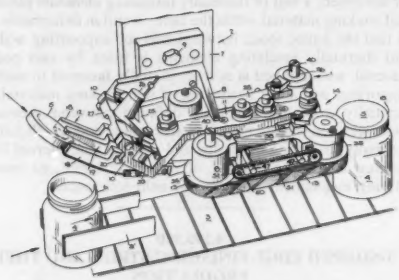
1. Orchard fruit handling apparatus for conveying and delivering harvested fruit into a plurality of storage bins comprising first conveyor means for transporting fruit received thereon in a generally linear direction, means for attaching said first conveyor means to extend along the side of a farm tractor to be transported thereby, said first conveyor means including a forward end portion for receiving harvested fruit and a rear end portion including chute means for gravitationally discharging the fruit therefrom; and trailer means for attachment to the rear of a farm tractor to be transported thereby, said trailer means including second conveyor means having a fruit-conveying surface positioned for receiving fruit from said chute means and for transporting the fruit in a generally horizontal linear path of travel along said trailer means, support means on said trailer means positioned beside and below said fruit-conveying surface of the second conveyor means and extending along the length thereof for supportably receiving a plurality of fruit storage bins in juxtaposed linear relation beside and below said second conveyor means, a plurality of bin filler means positioned in linear relation alongside said second conveyor means and above said bin support means for selectively receiving fruit discharged from said fruit conveying surface of the second conveyor means and defining a sinuous fruit-receiving passageway having a lower discharge outlet for gravitationally delivering fruit into corresponding storage bins located on said bin support means, and deflector means operatively connected to said second conveyor means for extending across said fruit-conveying surface thereof to deflect fruit from said surface into said bin filler means, said deflector means including means for moving said deflector means into and out of a fruit-deflecting position across said second conveyor surface whereby fruit may be selectively deflected into one or more of said bin filler means.

4,199,914

SEALING MACHINE CLOSURE CAP PICKUP

Charles S. Ochs, and James M. Herzog, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Sep. 8, 1978, Ser. No. 940,554
Int. Cl.[2] B65B *7/28;* **B67B** *3/20*
U.S. Cl. 53—314 **6 Claims**



1. An improved closure cap pickup for applying closure caps to moving containers in a sealing machine having a cap feeding chute comprising the combination of:

a cap guide adapted for being positioned at the lower end of the sealing machine cap feeding chute;

pivot means for mounting the cap guide on the sealing machine for movement about a generally horizontal axis and also about a generally vertically inclined axis;

the lower exit end of the cap guide extending to the entry end of the cap rotating means;

cap rotating means positioned beyond said cap guide for engaging the skirt portions of the closure caps and for turning the caps on containers comprising a pair of spaced endless belts having facing inner runs for engaging opposite sides of the cap skirts;

means mounting said belts for simultaneous movement in the same direction laterally of the moving containers for centering the caps with respect to the belts;

pressure means at said cap rotating means for urging the caps downwardly while they are turned by the cap rotating means;

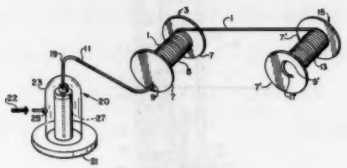
said belts having vertical widths substantially equal to the height of the cap skirts plus a distance equal to the pitch of the container engaging means on the caps.

4,199,915

ANEROBIC ADHESIVE PACKAGE AND METHOD FOR THE PRODUCTION THEREOF

Harris D. Levine, 14 Upton Rd., Albany, N.Y. 12208

Filed Sep. 19, 1978, Ser. No. 943,622
Int. Cl.[2] B65B 1/16, 3/10, 3/16, 3/26
U.S. Cl. 53—401 9 Claims



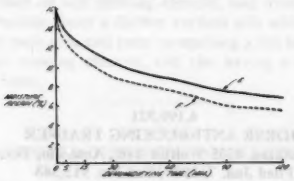
1. A method for producing sealed packages filled with anerobic adhesive material comprising the steps of winding a predetermined length of flexible, transparent, vapor-impervious, thermoplastic tubing onto a first reel, said tubing being open at both ends, the first of said ends being retained in association with said first reel; transferring a segment of said tubing, not exceeding fifty percent thereof and including the other of said ends, onto a second reel; delivering said anerobic adhesive material under pressure into said tubing through said first end thereof until said anerobic adhesive material reaches a point between said first reel and said second reel; halting delivery of said anerobic adhesive material to provide a slug of material completely filling the tubing on said first reel; displacing said slug of material toward said second reel by introducing gas under pressure into said first end of said tubing and continuing said displacement until the material fills said segment on said second reel and creates a vacant space approximately equal in volume to said filled segment, said vacant space extending from said first end of said tubing toward the second reel; transferring said segment from said second reel back onto said first reel; unwinding said tubing from said reel and sequentially heat-sealing spaced-apart portions of said tubing to provide closures in said tubing starting at said other end thereof, so as to cause said anerobic adhesive material displaced by said heat-sealed closure portions to flow away from said heat-sealed closure portions and toward said vacant space, adjacent spaced-apart closure portions of said tubing thereby producing individually sealed packages filled with anerobic adhesive material.

4,199,916

METHOD OF TREATING FIBROUS MATERIALS

Roshan L. Shishoo, Askim, Sweden, assignor to Tex Innovation AB, Vastra Frolunda, Sweden

Continuation-in-part of Ser. No. 735,551, Nov. 1, 1976, abandoned. This application Nov. 1, 1977, Ser. No. 847,666
Int. Cl.[2] B65B 31/00
U.S. Cl. 53—434 26 Claims



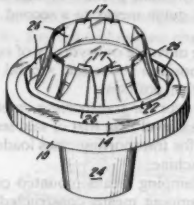
1. A method of conditioning fibrous material of natural or synthetic nature for vacuum packaging, comprising the steps of treating said fibrous material to reduce the relative regain of the fibers of the fibrous material to a level below the relative regain level of said fibrous material prior to said treatment, reducing the segment mobility level of the fibers of the fibrous material to a level below the segment mobility level of said fibers prior to said treatment and packaging said material while said relative regain level and said segment mobility level of the fibers of the fibrous material is at a level below the respective levels prior to said treatment.

4,199,917

APPLYING A STRETCH FILM LID TO A CUP

Richard P. Mitchell, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Dec. 26, 1978, Ser. No. 973,126
Int. Cl.[2] B65B 53/00, 7/28
U.S. Cl. 53—441 24 Claims



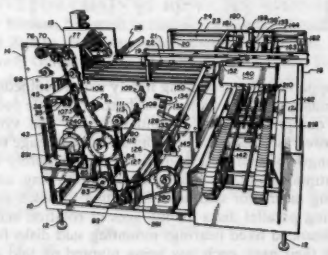
20. A method of applying a stretch film in sheet form to an article comprising: temporarily securing a stretch film to a substantiall planar stretching member about a central area thereof, said stretching member having a multiplicity of readily displaceable finger elements disposed in a substantially common surface beneath said film and extending inwardly of said central area; urging the article against the underside of said finger elements so as to displace said finger elements from said surface and from the plane of said stretching member and to define a passageway therebetween, said finger elements contacting the film and thereby cooperating to stretch said secured film along a plurality of axes; continuing to urge said article into said passageway and ultimately into surface contact with said stretched film; and releasing said film from said stretching member, whereby restorative forces in said stretched film coact to cause it to contract about said article and cling thereto.

4,199,918

CUP LOADER MACHINE

Bertel R. Peterson, San Juan Capistrano, Calif., assignor to FBM International, Inc., Minneapolis, Minn.

Filed Jan. 23, 1978, Ser. No. 871,362
Int. Cl.[2] B65B 5/08, 35/44
U.S. Cl. 53—537 9 Claims



1. A case filling machine for receiving a multiplicity of tapered wall containers from a conveyor and loading them into opened cases, said machine comprising, in combination:

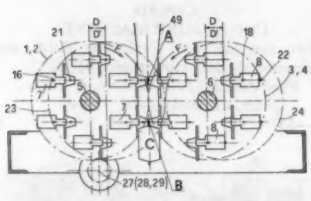
(a) a continuously driven serial conveyor for receiving containers and transporting a row of said containers to a first intermediate position within said machine, said serial conveyor comprising a continuously driven belt conveyor terminating in a low friction drive portion to reduce frictional drive forces imparted to the bottoms of said containers after they reach said first intermediate position, and wherein said low friction drive portion of said serial conveyor is comprised of flexible belt means which passes over a plurality of spaced support means, each of which forces the belt conveyor into contact with the bottoms of said containers only in the vicinity of said support means;
(b) guide means defining a plurality of container moving paths transverse to the path of said serial conveyor;
(c) drive means for propelling a row of said containers from said first intermediate position on said serial conveyor and through said guide means to a second intermediate position;
(d) a first frame movable transversely of said serial conveyor from a first position above said second intermediate position to a further position;
(e) a case conveyor for transporting empty cases into position at a lower level than that of said second intermediate position and for transporting cases loaded with containers from said machine;
(f) container clamping means mounted on said frame, said container clamping means constructed and arranged to releasably grip containers assembled at said second intermediate position and support them until said frame is moved to said further position; and
(g) means for vertically moving empty cases from said case conveyor into container receiving position below said further position of said frame with the bottom of said cases in close proximity with the bottom surface of said containers to receive said containers when said container clamping means is released, and for returning the case and containers to said case conveyor.

4,199,919

APPARATUS FOR PRODUCING NEARLY PARALLELEPIPEDAL PACKAGING CONTAINERS

Silvano Moscatelli, Perugia, Italy, assignor to I.B.P. Industrie Buitoni Perugina S.p.A., Perugia, Italy

Filed Nov. 28, 1977, Ser. No. 855,454
Claims priority, application Italy, Dec. 2, 1976, 52427 A/76
Int. Cl.[2] B65B *9/08, 9/12, 51/30*
U.S. Cl. 53—552 **11 Claims**



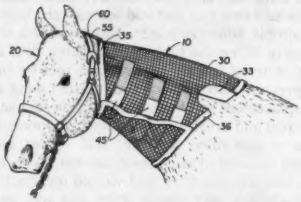
1. An apparatus for producing nearly parallelepipedal packaging containers, from a continuous hose of flexible packaging material, comprising two substantially equal and symmetrically opposed assemblies of jaws, mounted to engage between them a length of said hose and to maintain a purely translational continuous motion, said apparatus comprising: actuating and guiding means for said jaws, including for each assembly two rotating parallel disks having axes of rotation and transversely distanced fixed bearings mounting said disks for rotation about their axes, each jaw being pivoted on said disks at two points of the jaw which are at the same transverse distance as the rotating disks, to provide for each jaw a kinematic motion like that of an articulated parallelogram; said jaw having a portion forming a support, sealing means supported by each jaw, comprising a sealing member adapted to reciprocate with respect to said jaw portion forming a support; metering and shaping means supported by each jaw, comprising fixed plate means, pivoting square means and surfaces of said sealing means, said metering and shaping means only defining portions of only two sides of the container to be formed; and severing means, supported by each jaw, comprising blade means adapted to slide through said sealing means.

4,199,920

MANE TAMING DEVICE

Dean R. Hodges, and Carolyn M. Hodges, both of 11870 Kirkwood St., Hearld, Calif. 95638

Filed Jun. 26, 1978, Ser. No. 918,744
Int. Cl.[2] B68B *5/00, 7/00*
U.S. Cl. 54—1 **11 Claims**



1. A device for causing a horse's mane to lie flat against the horse's neck comprising:
a relatively nonporous flexible panel adapted to overlie the mane and hold the mane flat against the neck, the panel having a width less than the circumference of the neck so that the panel overlies only a region of the neck proximate the mane; and
means for holding the flexible panel in the overlying relationship, to thereby induce controlled sweating by the horse and retain moisture beneath the panel which causes the mane to remain flat when the device is removed.

4,199,921

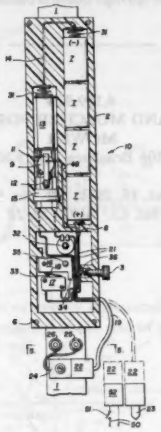
HORSE ANTI-BUCKING TRAINER

Harold E. Watkins, 4205 Wolflin Ave., Amarillo, Tex. 79106

Filed Jun. 7, 1978, Ser. No. 913,343
Int. Cl.[2] B68B *1/00;* **A01K** *15/00*
U.S. Cl. 54—71 **7 Claims**

1. An anti-buck horse trainer comprising a pair of electrodes each having opposite polarity disposed on a billet in proximate relation to the animal to be trained, voltage means formed from a battery powered induction coil to provide a potential difference of voltage between the two electrodes disposed on said

billet, and actuation means communicating with said voltage means to provide the voltage differential to the horse upon



bucking wherein said actuation means is defined by an adjustable inertia switch.

4,199,922

MOWING MACHINE

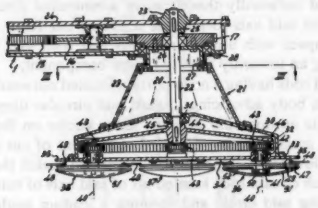
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 3, 1978, Ser. No. 930,800

Claims priority, application Netherlands, Aug. 10, 1977, 7708801; Aug. 10, 1977, 7708802

Int. Cl.[2] A01D *55/262*

U.S. Cl. 56—13.6 **30 Claims**



1. A mowing machine comprising at least one mowing assembly which includes a rotor mounted in said assembly for rotation about a substantially vertical main axis and which carries at least one mowing element, at least one cutting member provided on said mowing element, said mowing element being rotatable about a further vertical axis which is spaced from said main axis, said rotor comprising a rim located proximate said mowing element, said rim having a non-circular circumference.

4,199,923

APPARATUS FOR CUTTING AND COLLECTING GRASS CLIPPINGS

Duane Blake, Fairfield, Calif., assignor to Warren's Turf Nursery, Suisun City, Calif.

Filed Dec. 14, 1978, Ser. No. 969,623

Int. Cl.[2] A01D *75/30, 35/24*

U.S. Cl. 56—14.5 **11 Claims**

1. An apparatus for harvesting grass clippings comprising:

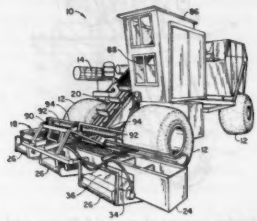
a motorized vehicle with wheels;

a T-shaped extension platform for cutting and recovering grass, said platform comprising:

(a) a central arm;

(b) means for pivotally mounting said central arm to said vehicle in a manner extending said central arm in front of said wheels;

(c) a lateral arm disposed at the end of said central arm, said lateral arm having front and rear sides and a substantially horizontally disposed trough with inner front, rear and bottom walls within said lateral arm, a plurality of reel-type scissor mower heads mounted to the outside of said front and rear sides, means defining outlets for discharge of grass clippings from said mower heads into said trough, an endless chain disposed within said trough and mounted on each end on pulleys, paddles mounted to said endless chain and disposed to mate with said inner walls of said trough, means coupled to said pulleys for moving said endless chain such that said



paddles are moved past said outlets toward said central arm, and discharge means between said trough and said central arm;

said central arm comprising a trough longitudinally extending from a first end adjoining said trough in said lateral arm to a second discharge end, an endless chain disposed in said central trough on pulleys adjacent each end of said central trough, paddles mounted to said endless chain and disposed to mate with inner walls of said central trough, and means coupled to said pulleys adjacent the ends of said central trough for moving said endless chain such that said paddles in said central trough are moved from said first end to said second discharge end; and

(d) dispensing means mounted at said discharge end of said central trough for recovering grass clippings cut by said mower heads and for delivering said grass cuttings cut by said mower heads and collecting said cuttings at a central location.

4,199,924

TENSIONING AND SAFETY APPARATUS FOR CONVEYOR CHAIN OF ROW-CROP HARVESTER

Theodor Eistert, Neustadt in Sachsen; Christian Noack, Guttau; Bernd Zumpe, Rathmannsdorf; Konrad Bergmann, Langburkersdorf; Gerhard Schmidt, Kirschau; Manfred Teichmann, Bischofswerda; Hans-Peter Spaida, Neustadt in Sachsen; Gerrit Unger, Sebnitz, and Arthur Hauschild, Neustadt in Sachsen, all of German Democratic Rep., assignors to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen, Neustadt in Sachsen, German Democratic Rep.

Filed Jun. 6, 1978, Ser. No. 913,233

Claims priority, application German Democratic Rep., Jun. 6, 1977, 199316

Int. Cl.[2] A01D *45/02*

U.S. Cl. 56—98 **10 Claims**

1. A row-crop harvester comprising:

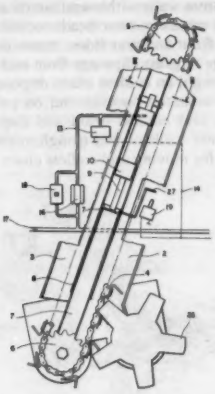
a frame displaceable along the ground and forming at least one forwardly opening throat;

a drive sprocket and an idler sprocket spaced apart along said throat;

an endless chain engaged over said sprockets and having a conveyor stretch exposed in said throat and a return stretch adjacent thereto;

an openable clutch having a pair of sides one of which is connected to said drive sprocket;

drive means connected to the other side of said clutch for rotating said drive sprocket and thereby advancing said conveyor stretch in said throat;



a fluid cylinder mounted on said frame and braced against said idler sprocket;

means for pressurizing said cylinder and thereby urging said idler sprocket away from said drive sprocket for tensioning said chain between said sprockets; and

safety-cutoff means connected between said cylinder and said clutch for opening the latter when pressure in the former drops suddenly.

4,199,925

CROP HARVESTING MACHINE

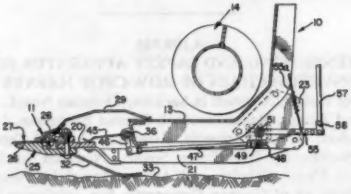
Graeme R. Quick, Lilydale, Australia; Walter E. Harris, Brantford, Canada; Ernest J. Riddle, Burford, Canada, and Terrence S. Robinson, Harley, Canada, assignors to White Motor Corporation of Canada Ltd., Brantford, Canada

Filed Feb. 1, 1978, Ser. No. 874,122

Claims priority, application Canada, Feb. 7, 1979, 271234

Int. Cl.[2] A01D *67/00*

U.S. Cl. 56—208 **9 Claims**



1. A crop harvesting machine comprising, a header, a floating cutterbar, and means for supporting the cutterbar on the header including generally horizontally extending support arms for the cutterbar having the cutterbar mounted at the forward ends thereof, pivot means at the rearward ends of said support arms pivotally connecting the arms to the header, a support spring for each support arm extending from near the rearward end of the support arm and forwardly thereof to apply a lifting force to the cutterbar through the support arms, means on the header holding the forward end of the spring against downward movement, adjustable means on the support arm adjacent the rearward end thereof connecting the rearward end of the spring thereto, and fulcrum means on the support arm resting on the spring intermediate its ends thereof, whereby the support springs counterbalance the cutterbar.

4,199,926

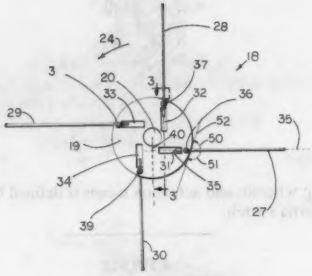
GRASS CUTTER AND MULCHER FOR ROTARY LAWN MOWER

Richard H. Petty, 8106 Braeburn Ter. #3G, Indianapolis, Ind. 46219

Filed Oct. 19, 1978, Ser. No. 952,689

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—295 **9 Claims**



1. A grass cutter and mulcher for a rotary lawn mower having a rotatable output drive shaft comprising:

a main body operatively associated with said shaft and rotatable therewith in a circle about a substantially vertical axis of rotation;

a plurality of flexible rods mounted fixedly to said main body to extend outwardly therefrom in a nonradial direction relative to said axis to provide a slicing cut force upon initial impact with upstanding grass and with said force including an inwardly directed force component;

each of said rods having a main portion located outwardly of said main body advancing toward said circular direction to provide an inwardly directed force vector on the upstanding grass reducing outward movement of cut grass and to allow following rods to contact and mulch the cut grass, each of said rods located aft of said axis of rotation intersecting said circle and forming a leading angle between each rod and a tangent to said circle whereat said rod intersects and a trailing angle between said tangent and said rod with said leading angle being less than said trailing angle, said rods being immovable relative to said main body except for flexing.

4,199,927

COMBINE REEL WEED SHIELD

R. Colin Craig, 511 Walnut Hills, and John R. Craig, 505 Windy Ct., both of Kokomo, Ind. 46901

Filed Apr. 12, 1978, Ser. No. 895,546

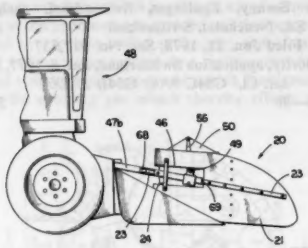
Int. Cl.[2] A01D *75/18*

U.S. Cl. 56—314 **22 Claims**

1. A weed shield for use with a platform-style combine of the type having reel support arms for keeping weeds and other plants from wrapping around the hub portion of the reel, said weed shield comprising:

a substantially flat, upright panel member having a reel-facing surface;

a rigid bar member secured to said panel member and including a free end for attachment to a reel support arm; and



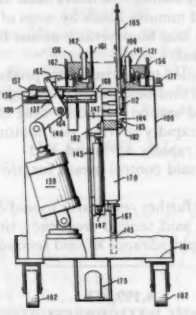
said panel member extending horizontally and vertically so as to cover a majority of the end of said reel and extend forward of said reel.

4,199,928

TOW SPLICING APPARATUS

Lucian M. Cristaldi, Haddonfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1978, Ser. No. 966,255
Int. Cl.[2] B65H *69/06*; D02J *1/08*
U.S. Cl. 57—22 **2 Claims**



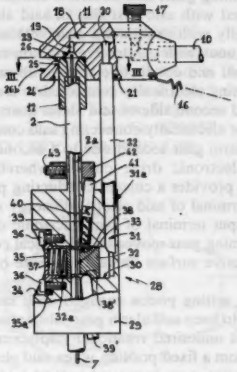
1. In a tow splicing apparatus that includes a yarn clamping assembly for securing a plurality of pairs of abutting parallel yarn segments in spaced configuration, and an assembly for joining the filaments of one yarn segment of each pair with the filaments of the other yarn segment of that pair to form a joint, a device for dividing a tow into a plurality of substantially equal-sized segments comprising: a member attached to said yarn clamping assembly having a plurality of slots therein for reception of individual segments of yarn; a plurality of flexible guides, each guide being attached at one end to a location between said slots and extending in a vertical direction, said guides being pointed at their other ends; means for releasably pressing together the pointed ends of said guides; a retractable U-shaped anvil for supporting said tow to flatten it into a uniform warp positioned astride said pointed ends, said anvil being movable vertically from a position above said pointed ends to a position below said pointed ends as the tow is flattened on said anvil; and means for retracting said anvil from the vicinity of said pointed ends and releasing the pressure on said flexible guides as said tow is forced between said pointed ends in being flattened on said anvil into a uniform warp.

4,199,929

DEVICE FOR PNEUMATICALLY THREADING YARN FOR A DOUBLE TWIST SPINDLE

Patrick Vessella, Villeurbanne, France, assignor to Verdol S.A., Caluire, France

Filed Jul. 17, 1978, Ser. No. 926,063
Claims priority, application France, Jul. 20, 1977, 77 22839
Int. Cl.[2] D01H *7/86, 13/10*
U.S. Cl. 57—279 **8 Claims**



1. A device for pneumatically threading yarn through the axial bore of a hollow shaft supporting a double twist spindle mechanism, wherein the shaft has a normally applied yarn brake located in its bore, comprising:

pneumatic retracting means connected to the yarn brake for retracting the brake and opening the bore;

pneumatic head means operative to pass air through the bore to jet the yarn therethrough; and

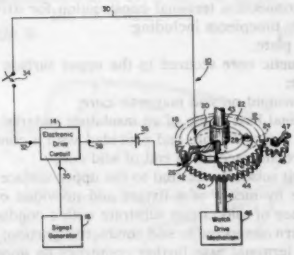
pneumatic distributing means connected with said retracting means and said head means and operative sequentially to first retract said yarn brake and thereafter to pass air through the bore of the shaft.

4,199,930

ALARM SWITCH FOR AN ALARM CIRCUIT IN A HOROLOGICAL DEVICE

Jean-Philippe Lebet, Les Geneveys-sur-Coffrane, and Jean-Claude Droz, Neuchatel, both of Switzerland, assignors to The Gillette Company, Boston, Mass.

Filed Jan. 19, 1978, Ser. No. 870,786
Int. Cl.[2] G04C *21/16*
U.S. Cl. 368—252 **5 Claims**



1. In a horological device of the type having a drive mechanism for moving a timing gear and an attached indicator across a dial, and a source of electrical energy with a first terminal

coupled to a first input terminal of an electronic drive circuit arranged to operate an electroacoustical transmitting system to provide an audible signal at a predetermined time, the improvement comprising:

said electrical energy source having a second terminal electrically connected to said timing gear;

an alarm gear having a first side and a second side;

switching means having an electrical contact electrically connected to said timing gear and arranged to move with said timing gear, said electrical contact being frictionally engaged with said first side of said alarm gear mounted coaxially with said timing gear with an insulated surface contiguous with conductive and non-conductive surfaces thereon, said conductive surface on said alarm gear first side being electrically connected to a conductive surface on said second side of said alarm gear;

means for electrically connecting said conductive surface on said alarm gear second side to a second input terminal of said electronic drive circuit, whereby said switching means provides a current conducting path from said second terminal of said electrical energy source to said second input terminal of said electronic drive circuit when said timing gear moves said electrical contact against said conductive surface on said first side of said alarm gear; and

an alarm setting pinion engaged with said alarm gear and biased to keep said alarm gear substantially motionless and prevent undesired rotational displacement of said alarm gear from a fixed position when said electrical contact on said timing gear is moved against said first side of said alarm gear.

4,199,931

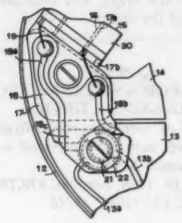
CONNECTION TERMINAL CONSTRUCTION FOR DRIVING COILS OF ELECTRONIC TIMEPIECES

Akira Yokoyama, Higashiyamato, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,855

Int. Cl.[2] **G04C** *3/00;* **G04B** *33/00, 29/02;* **H02K** *11/00*

U.S. Cl. 368—318 **7 Claims**



1. A connection terminal construction for driving coils of electronic timepieces including:

a base plate;

a magnetic core secured to the upper surface of said base plate;

a coil wound on said magnetic core;

a terminal base made of an insulating material, attached to said magnetic core and provided with a conductive portion connected to an end of said coil;

a circuit substrate secured to the upper surface of said base plate by means of a fixture and provided on the upper surface of said circuit substrate with a conductive wiring pattern connected to said conductive portion; WHEREIN said terminal base further comprises an upper insulating part and a lower insulating part fixed to each surface of said conducting portion respectively, and said upper insulating part is provided with a hole through which said conducting portion is exposed, and said end of said coil being connected to said conductive portion therethrough.

4,199,932

ELECTRONIC TIMEPIECE WITH MIXED TIME SETTING

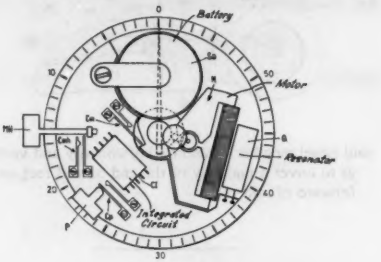
Jean-Claude Berney, Epalinges, Switzerland, assignor to Ebauches SA, Neuchatel, Switzerland

Filed Jun. 21, 1978, Ser. No. 917,537

Claims priority, application Switzerland, Jul. 5, 1977, 8226/77

Int. Cl.[2] **G04C** *9/00;* **G04B** *27/00*

U.S. Cl. 368—80 **5 Claims**



1. An electronic timepiece with mixed time setting, comprising:

means for producing time base pulses of a first and second frequency;

a stepping motor driven from said time base pulses;

a seconds hand driven by said stepping motor;

a minutes hand and an hours hand driven by said seconds hand;

means for manually setting said hours hand independently of said seconds and minutes hands by steps of 1/12 of a turn;

means coupled to said hour setting means for producing a first control signal;

control means coupled to said time base producing means for interrupting said time base pulses stopping said motor, and for selecting said second frequency time base pulses, said selected pulses rapidly driving said motor whereby said seconds hand is rapidly advanced; and

means coupled to said control means for providing a detection signal;

said control means further responsive to said detection signal for interrupting said second frequency time base pulses stopping said rapid advance of said seconds hand.

4,199,933

POWER PLANT WITH PRESSURIZED-GAS GENERATOR

Hans Pfenninger, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Continuation of Ser. No. 690,926, May 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 531,110, Dec. 9, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 872,906

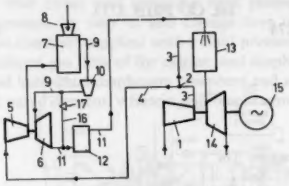
Claims priority, application Switzerland, Dec. 22, 1973, 18016/73

Int. Cl.[2] **F02B** *43/08;* **F02C** *3/22*

U.S. Cl. 60—39.12 **6 Claims**

1. A power plant comprising at least one thermal prime mover, a pressurised-gas generator for generating hot pressurised producer gas from coal, said pressurised producer gas after separation of dust and sulphur therefrom being utilized as the fuel for the power plant, and further comprising a pressure-charging group consisting of coupled compressor and gas turbine units, said compressor serving to compress air and deliver it to said pressurised-gas generator, and said gas turbine unit being driven by the hot pressurised and unburned producer gas from said pressurised-gas generator, two dry-state dust separators for dust entrained in the producer gas arranged in series in the flow path of the producer gas after leaving said pressurised-gas generator, the first of said dust separators being

of the cyclone type which functions to remove the coarser of the dust particles entrained in the producer gas and the second said separator being structurally integrated into said gas turbine unit and which functions to remove any dust particles still remaining in the producer gas, said second dust separator being constituted by a volute casing at the inlet end of said gas turbine, said volute casing serving as a replacement for the normally used row of guide vanes and which functions to impart a spin to the entering gas which thereby effects centrifugal



separation out of the dust particles thus to avoid any erosive action on the turbine rotor blading, an annular duct formed in the outer wall of said inlet end of said turbine ahead of the first row of rotor blading for receiving the centrifuged out dust particles through an entrance gap, said producer gas following expansion in passing through said gas turbine accompanied by a drop in temperature and without further cooling then being passed through a dry state porous mass which chemically binds and removes the sulphur content prior to delivery to the combustion chamber or boiler for the prime mover.

4,199,934

COMBUSTION CHAMBER, ESPECIALLY FOR GAS TURBINES

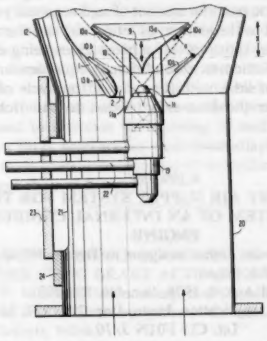
Franz-Josef Meyer, Marbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 705,530, Jul. 15, 1976, abandoned. This application Aug. 10, 1978, Ser. No. 932,547

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1975, 2533115

Int. Cl.[2] F02C 7/22

U.S. Cl. 60—39.23 **17 Claims**



1. A combustion chamber with an end-wall means having an axial inlet opening on an inlet side thereof, a first wall portion downstream of the end-wall means provided with secondary air inlet openings, means for supplying preheated combustion air into the combustion chamber, fuel injection means including a fuel injection nozzle disposed upstream of the inlet opening for injecting fuel into the preheated combustion air, first deflection means disposed essentially axially inside of the inlet opening for radially spreading out the fuel-air mixture flowing into the combustion chamber along the end-wall means, and second deflection means on the inside of the combustion chamber downstream of the first deflection means for forming an annular swirl so as to recombine the fuel-air mixture, characterized in that means are provided for mounting the first deflection means inside of the inlet opening so as to be axially adjustable with respect to the combustion chamber, and in that means are provided for supporting the injection nozzle so as to be axially adjustable with respect to the inlet opening of the combustion chamber.

4,199,935

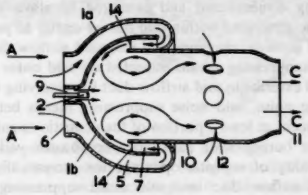
COMBUSTION APPARATUS

John P. D. Hakluytt, Botley, Near Southampton, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 28, 1975, Ser. No. 636,058

Int. Cl.[2] F02C 1/00; F02G 3/00

U.S. Cl. 60—734 **5 Claims**



1. Combustion apparatus for the combustion of fuel in an airstream which comprises a combustion chamber having a concave inner surface at the upstream end thereof, means associated with said concave surface for directing combustion air over the entire periphery of said surface towards the middle of the surface so as to form a stable vortex pattern near said surface, and means for injecting fuel from the middle of the surface into the air flowing in generally the opposite direction thereto along said surface towards the middle thereof, wherein vortical flow within the vortex is in an upstream direction in the region of the periphery of the concave surface and wherein combustion of the fuel takes place substantially within the vortex pattern.

4,199,936

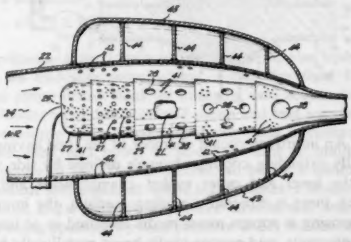
GAS TURBINE ENGINE COMBUSTION NOISE SUPPRESSOR

Samuel J. Cowan, Seattle; Robert P. Gerend; James W. Ramsay, both of Bellevue, and Belur N. Shivashankara, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 644,334, Dec. 24, 1975, abandoned. This application Jul. 8, 1977, Ser. No. 813,887

Int. Cl.[2] F02K 3/00

U.S. Cl. 60—226 R **10 Claims**



1. A combined combustor and combustion noise suppressor

for a gas turbine engine including a compressor and a turbine, comprising:

an outer combustor wall defining an airflow duct between said compressor and said turbine, said outer wall having an inner surface;

an inner combustor wall defining a burner cavity, said inner wall being mounted in said airflow duct in spaced relationship from the inner surface of said outer wall, said inner combustor wall including a plurality of air inlet openings therein for placing said burner cavity in fluid communication with said duct, said air inlet openings being dimensioned to allow air flowing through said airflow duct to flow into said burner cavity, said inner combustor wall further including a plurality of acoustic openings for acoustically coupling said burner cavity and said airflow duct, said acoustic openings being dimensioned and arranged to have a low coefficient of discharge relative to the coefficient of discharge of said air inlet openings for minimizing airflow through said acoustic openings and being dimensioned and arranged to allow combustion noise generated within said burner cavity to pass through said acoustic openings and into said airflow duct; and

noise suppressing means mounted on said outer combustor wall exterior to said airflow duct for receiving and attenuating noise, said noise suppressing means being located adjacent at least a portion of the acoustic openings in said inner burner wall, said outer combustor wall having a plurality of acoustic openings for acoustically coupling said airflow duct and said noise suppressing means to allow said combustion noise to be transmitted from said burner cavity through said airflow duct and into said noise suppressing means.

4,199,937

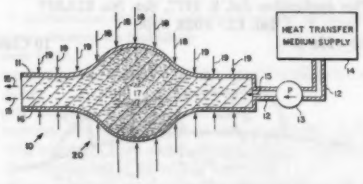
HEAT EXCHANGER AND METHOD OF MAKING

Anthony Fortini, Cleveland, and John M. Kazaroff, Rocky River, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 559,846, Mar. 19, 1975, Pat. No. 4,108,241. This application Nov. 30, 1977, Ser. No. 856,462

Int. Cl.² F02K *11/02*

U.S. Cl. 60—267 **9 Claims**



1. An improved rocket chamber of the type having longitudinally extending cooling channels defined by side walls and by the inner and outer rocket chamberwalls and through which there is directed a cooling medium, the improvement comprising a porous metal media disposed in at least one of said channels, said porous media being metallically bonded to said inner wall and wherein said porous media has a maximum cross-sectional area at the location of maximum heat flux.

4,199,938

METHOD OF OPERATING A THREE-WAY CATALYST FOR INTERNAL COMBUSTION ENGINES

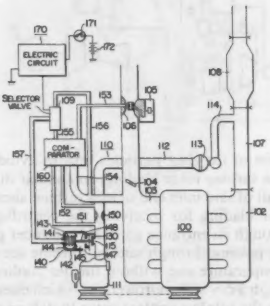
Takamichi Nakase, Gamagori; Tadashi Hattori, Okazaki; Junichiro Naito, Toyokawa, and Kenji Kondo, Hoi all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 22, 1977, Ser. No. 863,579

Claims priority, application Japan, Dec. 26, 1976, 51-157284; Feb. 28, 1977, 52-21084; Mar. 18, 1977, 52-30855; Oct. 12, 1977, 52-122000

Int. Cl.² F01N *3/15*

U.S. Cl. 60—274 **8 Claims**



1. In an internal combustion engine having three-way catalyst in an exhaust system of the engine, the three-way catalyst including an oxygen storage material, a method for operating the three-way catalyst comprising the steps of:

supplying an air-fuel mixture having a fixed air-fuel ratio to the engine, said fixed air-fuel ratio being smaller than a stoichiometric air-fuel ratio;

intermittently supplying a secondary air to the exhaust system of the engine upstream of said three-way catalyst at a frequency greater than 0.5 Hertz to thereby alternately vary air-fuel ratios of exhaust gases to a rich side in which the air-fuel ratio is smaller than the stoichiometric one and to a lean side in which air-fuel ratio is larger than the stoichiometric one, the amount of said secondary air being proportional to the amount of intake air, and the variation of the air-fuel ratios of the exhaust gases being displaced from the stoichiometric condition by equal amounts to the rich and lean sides with the ratio of the cycle of the displacement to the lean side to that to the rich side is 0.24/0.55.

4,199,939

SECONDARY AIR SUPPLY SYSTEM FOR THE EXHAUST SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Kyo Hattori, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Apr. 4, 1978, Ser. No. 893,393

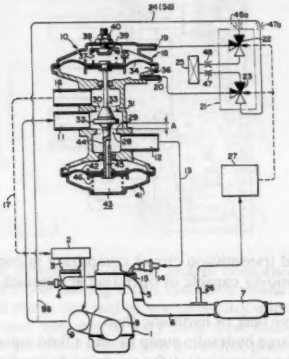
Claims priority, application Japan, Dec. 29, 1977, 52/159305

Int. Cl.² F01N *3/10*

U.S. Cl. 60—276 **10 Claims**

1. A secondary air supply system for the exhaust system of an internal combustion engine, comprising a source of compressed air, an air control valve which supplies a part of the air delivered from said source to the exhaust system of the engine while relieving the rest of the air, an oxygen detector for detecting residual oxygen contained in the exhaust gases flowing through the exhaust system, a source of actuating fluid pressure, a change-over valve for said actuating fluid pressure, and a controller which changes over said change-over valve in accordance with the output of said oxygen detector, said air control valve having an inlet port for receiving air from said

source of compressed air, an outlet port for supplying a part of the air received to the exhaust system, a relief port for relieving the rest of the air received, a first passage which connects said inlet port and said outlet port, a second passage which connects said inlet port and said relief port, a valve element which reciprocally controls the openings of said first and second passages, first and second springs which reciprocally operate to balance said valve element at a position where a predetermined opening ratio of said first passage to said second passage is established, first and second diaphragm chambers selectively supplied with either said actuating fluid pressure or atmospheric pressure by way of said change-over valve, a third diaphragm chamber supplied with a fluid pressure which represents exhaust gas flow of the engine, and diaphragms which define said individual diaphragm chambers and are connected with said valve element, wherein said diaphragms are adapted



so as to shift said valve element against the balancing force of said first and second springs in the direction to increase the opening of said first passage and to decrease the opening of said second passage when the fluid pressure in said first diaphragm chamber is lower than the fluid pressure in said second diaphragm chamber, so as to shift said valve element against the balancing force of said first and second springs in the direction to increase the opening of said second passage and to decrease the opening of said first passage when the fluid pressure in said second diaphragm chamber is lower than the fluid pressure in said first diaphragm chamber, and so as to shift said valve element by varying the balance point of said first and second springs in the direction to increase the opening of said first passage and to decrease the opening of said second passage when the fluid pressure in said third diaphragm chamber changes so as to indicate increase of secondary air demand or exhaust gas flow of the engine.

4,199,940

DUAL POWER BRAKE BOOSTER AND METHOD OF GENERATING BRAKE ACTUATING PRESSURE

Thomas P. Mathues, Miamisburg, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 587,148, Jun. 16, 1975, abandoned, which is a continuation of Ser. No. 441,239, Feb. 11, 1974, abandoned. This application Jun. 9, 1977, Ser. No. 805,114

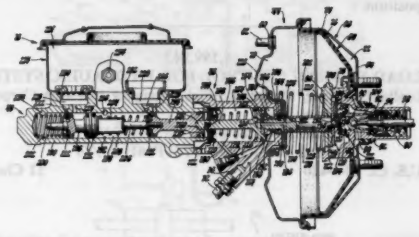
Int. Cl.[2] B60T *13/56*

U.S. Cl. 60—547 R **5 Claims**

1. A brake booster system having a wheel cylinder actuating member and first and second booster sections sequentially operable to sequentially operate said wheel cylinder actuating member, said first and second booster sections being respectively defined by first and second power boosters and effective for manual operation of said wheel cylinder actuating member upon runout of both of said boosters, said system comprising in combination:

a manually movable input member;

said first power booster having a housing into which said input member extends, a pair of booster output force transmitting output elements extending out of said housing and movable in follow-up moving relation to said input member and effective under normal power boost operation of said wheel cylinder actuating member by said first power booster to move in unison with said input member, one of said pair of output elements being effective to have relative movement in relation to said input members only when a first power booster runout condition exists;



said second power booster having a housing;

said pair of output elements also being part of said second power booster and extending into said second power booster housing from said first power booster and providing a pair of input control elements for said second power booster within said second power booster housing effective in follow-up moving relation to said input member only upon said runout relative movement to condition said second power booster for power boost operation;

said wheel cylinder actuating member being operatively connected with at least one of said pair of output elements to be responsive to movements of said input member.

4,199,941

HYDRAULIC SYSTEMS

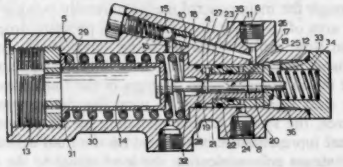
Glyn P. R. Farr, Leek Wooton, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 29, 1978, Ser. No. 937,706

Claims priority, application United Kingdom, Sep. 1, 1977, 36467/77

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—413 **8 Claims**



1. An hydraulic system for a vehicle comprising an hydraulic pump, an hydraulic accumulator, a tank for fluid from which said pump draws fluid for charging said accumulator, and an unloader valve between said pump and said accumulator for preventing said accumulator from being overcharged and for allowing said pump to re-charge said accumulator should pressure of fluid stored therein fall below a minimum value, wherein said unloader valve incorporates a housing, a control valve, and a pressure responsive slave in said housing, said valve being operated by fluid pressure under the control of said control valve, said control valve comprising a valve member which is movable between a first position in which said

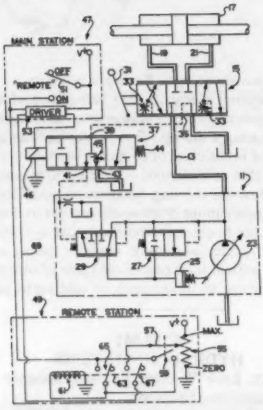
accumulator is isolated from said slave so that pressure from said pump is supplied to said accumulator, and a second position in which pressure from said accumulator can act on said slave to render said slave operative to reduce said pressure from said pump to that of said tank, and spring means for biassing said valve member towards said first position, said valve member being subjected to a control pressure dependent upon the pressure in said accumulator and in response to which said valve member can move at a cut-out point from said first position into said second position against the bias in said spring means, said bias in said spring means determining a cut-in point at which pressure in said accumulator is less than said pressure in said accumulator at a cut-out point at which said valve member can move from said second position into said first position.

4,199,942

LOAD SENSING CONTROL FOR HYDRAULIC SYSTEM

Leslie J. Kasper, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 28, 1978, Ser. No. 946,915
Int. Cl.[2] F15B *11/16*; F16H *39/46*
U.S. Cl. 60—420 **11 Claims**



1. In a system for controlling the flow of fluid from a variable fluid delivery source to a fluid actuated device, the system including main control means disposed in series flow relationship between the fluid source and the fluid actuated device, the main control means including a main flow orifice, the flow through the main control means normally being a function of the area of the main flow orifice, the pressure drop across the main flow orifice normally being substantially constant, the variable fluid delivery source including a load signal chamber and means responsive to changes in the fluid pressure within the load signal chamber to vary the delivery of the fluid source, the system further including means providing a load signal representative of the load on the fluid actuated device, and means communicating the load signal to the load signal chamber, the improvement comprising:

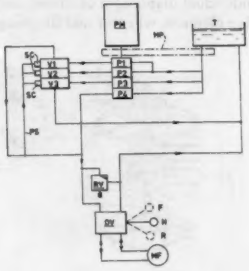
valve means disposed within said load signal communicating means, said valve means including a first port in fluid communication with said load signal providing means, a second port in fluid communication with said load signal chamber, and a third port in fluid communication with a source of reference fluid, said valve means including a movable valve member having a first position permitting fluid communication between said first and second ports and isolating said third port, said movable valve member having at least one position permitting partial fluid communication between said first port and said second port and between said first port and said third port, the movement of said movable valve member being independent of the operation of the main control means.

4,199,943

FLUID TRANSMISSION CIRCUIT

William A. Hunt, Tynemouth, England, assignor to Elmco (Great Britain) Limited, Team Valley, England

Filed Dec. 21, 1977, Ser. No. 863,041
Claims priority, application United Kingdom, Dec. 24, 1976, 54057/76
Int. Cl.[2] F15B *13/09*
U.S. Cl. 60—430 **2 Claims**



1. A fluid transmission circuit comprising in combination:

a prime mover capable of operating at constant power output;

a reservoir tank of hydraulic fluid;

a single large hydraulic pump having a fluid input connected with the reservoir tank for receiving hydraulic fluid and a fluid output for delivering pumped hydraulic fluid;

means connecting said prime mover to said large pump in driving relationship;

a bank of at least three smaller hydraulic pumps also connected in driving relationship with said prime mover so as to be driven in unison with each other and the large pump by said prime mover, and having fluid inputs connected with the fluid output of said large hydraulic pump to receive hydraulic fluid from the reservoir tank;

a reversible fluid motor coupled to a common fluid output of said bank of smaller pumps;

a control valve incorporating forward, neutral and reverse positions and being interposed in the fluid circuit between said bank of smaller pumps and said reversible motor;

a diverting valve means;

a pressure-sensing fluid line, separate from the fluid lines to and from said smaller pumps, connecting the input of the diverting valve means to the fluid flow passing through said reversible motor;

and means biassing said diverting valve means initially into a position in which each of the fluid outputs from said smaller pumps is delivered to said reversible motor, the arrangement being such that, as the demands on the motor increase and the pressure of fluid passing through the motor rises through a succession of predetermined levels, the pressure-sensing line will sense the rises in pressure and, at each successive pressure level, will cause the diverting valve means to automatically divert the fluid outputs of successive ones of said smaller pumps back to the reservoir tank without passing through the motor, the smaller pump outputs being automatically switched into the motor supply line again, one after the other and in reverse order from that in which they were switched out, by the diverting valve means as the demand on the motor subsequently falls.

4,199,944

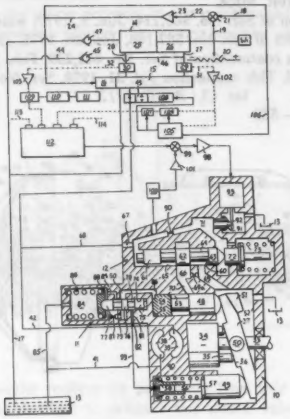
LOAD RESPONSIVE SYSTEM PUMP CONTROLS

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Continuation-in-part of Ser. No. 835,999, Sep. 23, 1977, Pat. No. 4,139,987. This application Jan. 11, 1979, Ser. No. 2,844

Int. Cl.² F16H *39/46*

U.S. Cl. 60—445 **10 Claims**



1. A fluid power and control system comprising a fluid pump, a fluid motor driving a load, and valve means interposed between said pump and said motor to control said load, flow changing means operable to vary fluid flow delivered from said pump to said fluid system and to control pressure in said fluid system, control signal generating means having means to generate a first electrical control signal proportional to magnitude of said load, logic means responsive to said first electrical control signal and operable to transmit a second electrical signal when said load driven by said fluid motor is of an aiding type, isolating valve means responsive to said second electrical signal and operable to isolate fluid flow from said pump to said fluid motor, a source of low pressure fluid, and fluid replenishing means operable to connect said fluid motor with said source of low pressure fluid when said isolating valve means isolates said fluid motor from said pump.

4,199,945

METHOD AND DEVICE FOR BALANCED COMPOUNDING OF STIRLING CYCLE MACHINES

Theodor Finkelstein, P.O. Box 643, Beverly Hills, Calif. 90213

Filed Jul. 27, 1977, Ser. No. 819,583

Int. Cl.² F02G *1/04*

U.S. Cl. 60—520 **16 Claims**

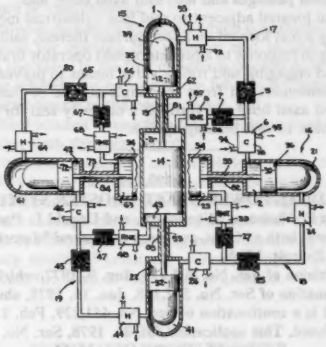
1. In a method of operating a Stirling cycle machine incorporating a plurality of Stirling thermodynamic cycles each of which comprises the steps of successively expanding, cooling, compressing and heating a compressible operational medium, wherein each thermodynamic cycle is performed in an expansible compression space maintained at a first temperature and at least one interconnected expansible expansion space maintained at a different temperature, the improvement comprising:

arranging said spaces in a plurality of generally coaxial pairs separated by a double-acting reciprocating piston having two opposed surfaces, the first of which defines in part a first expansible space associated with one thermodynamic cycle and the second of which defines in part a second expansible space associated with a different thermodynamic cycle,

the volume of said second space varying inversely with the volume of said first space,

said pistons being arranged to form at least two reciprocable piston assemblies, each comprising at least two axially rigidly interconnected pistons, whereby reciprocating movement of each said assembly produces simultaneous variations in the volumes of at least four expansible spaces,

exposing one surface of a first opposed pair of piston surfaces in an assembly to the time-variable pressure in the compression space of a first thermodynamic cycle, and



exposing the second surface of said pair to the time-variable pressure in the compression space of a second thermodynamic cycle in phase opposition to said first cycle, whereby the forces exerted on said surfaces by said pressures are combined to produce a fluctuating output force acting along a straight line which is stationary in space.

4,199,946

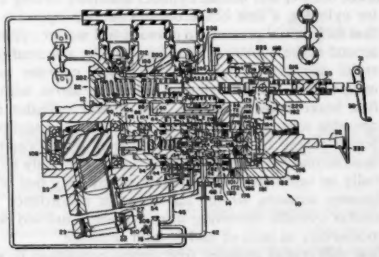
INTEGRATED CONTROL FOR BRAKE AND STEERING SYSTEMS

Robert K. Wilson, Granger, and Jerome T. Ewald, South Bend, both of Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Mar. 3, 1978, Ser. No. 882,716

Int. Cl.² B60T *13/00*

U.S. Cl. 60—547 B **14 Claims**



1. In a vehicle having fluid power assisted braking and steering systems, an integrated control mechanism for regulating fluid communication from a single source to the braking and steering systems, said integrated control comprising:

a housing having a bore therein connected to said single source of fluid;

rotary valve means located in said bore, and rotating in response to an operator steering signal for controlling the communication of said single source of fluid to said steering system;

sleeve means concentrically located in said bore with respect to said rotary valve means and responsive to an operational feed back signal from said steering system to match the communication of fluid from the source to the steering system with the operator steering signal;

spool valve means having a first cylindrical member concentrically located in said bore with respect to said rotary valve means, said first cylindrical member having an axial bore therethrough connected to a peripheral groove by radial passages, said first cylindrical member linearly moving in response to an operator braking signal to meter said single source of fluid into said groove, through said radial passages and into said axial bore; and

a disc located adjacent to said first cylindrical member having a seal located on a face surface thereof, said disc moving in response to a predetermined operator braking signal and engaging said rotary valve means to prevent the flow communication from the single source of fluid through said axial bore and through a one-way seal for communication to said braking system.

4,199,947

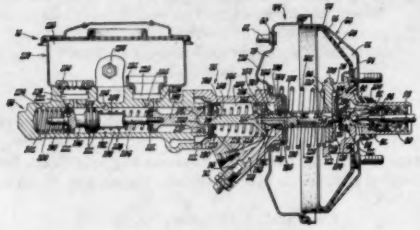
DUAL POWER BRAKE BOOSTER SYSTEM

Thomas P. Mathues, Miamisburg, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 805,114, Jun. 9, 1977, which is a continuation of Ser. No. 587,148, Jun. 16, 1975, abandoned, which is a continuation of Ser. No. 441,239, Feb. 11, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,346

Int. Cl.[2] B60T *13/12, 13/56*

U.S. Cl. 60—547 R **3 Claims**



1. A brake system comprising:

a brake booster and master cylinder assembly having a master cylinder, a first brake booster section operable by a first differential pressure to operate said master cylinder, a second brake booster section operable by a second differential pressure to operate said master cylinder and in independent master cylinder operating series with said first brake booster section, said master cylinder being operable selectively (a) by one of said booster sections to power runout followed by the other of said booster sections so that both of said booster sections act only sequentially on said master cylinder, or (b) by only one of said booster sections, or (c) manually, in accordance with master cylinder operating force requirements and power availability to each of said booster sections;

a first differential pressure first source connected to make power available to said first brake booster section;

a hydraulic second differential pressure second source independent of said first source and connected to make power available to said second brake booster section;

said second booster section having a hydraulic fluid inlet and a hydraulic fluid outlet;

hydraulic fluid source means for said master cylinder and for said second source, said hydraulic fluid source means including at least one reservoir defining a master cylinder hydraulic fluid reservoir;

and passage means connecting at least a portion of said hydraulic fluid source means with said second booster section hydraulic fluid outlet and connecting said hydraulic fluid source means with said hydraulic second differential pressure second source to supply fluid thereto and connecting said hydraulic second differential pressure second source and said second booster section hydraulic fluid inlet.

4,199,948

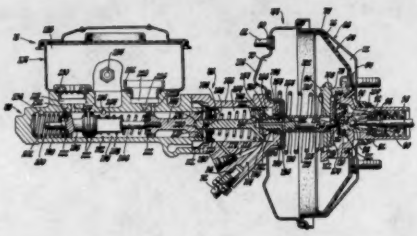
DUAL POWER BRAKE BOOSTER

Thomas P. Mathues, Miamisburg, and Donald L. Parker, Middletown, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 805,114, Jun. 9, 1977, which is a continuation of Ser. No. 587,148, Jun. 16, 1975, abandoned, which is a continuation of Ser. No. 441,239, Feb. 11, 1974, abandoned. This application Jul. 31, 1978, Ser. No. 929,691

Int. Cl.[2] B60T *13/12, 13/56*

U.S. Cl. 60—553 **2 Claims**



1. A brake booster and master cylinder assembly comprising:

a first differential pressure powered booster section having a first control valve;

a second differential pressure powered booster section in operative series therewith and having a second control valve;

a master cylinder section in operative series with said booster sections to be operated thereby;

and manual force input means controlling the actuation of said booster sections by operating said control valves and providing for manual operation of said master cylinder section;

one of said booster sections power operating said master cylinder section by operation of its control valve by said manual force input means in sequence with and subsequently to the power operation of said master cylinder section throughout the available range of power operation of the other of said booster sections by operation of its control valve by said manual force input means, said one booster section having a reaction ratio substantially different from the reaction ratio of said other booster section whereby the amount of additional manual force required at said manual force input means for a predetermined increase in brake actuating pressure out of said master cylinder section changes substantially when said one booster section power operates said master cylinder section after said other booster section power operates said master cylinder section.

4,199,949

HYDRAULIC MASTER CYLINDER

Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy

Filed Oct. 13, 1977, Ser. No. 841,785

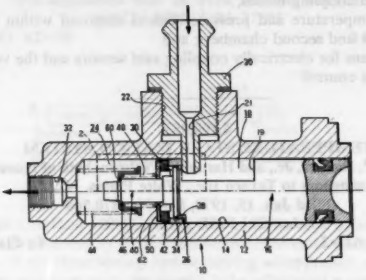
Claims priority, application Italy, Oct. 15, 1976, 28356 A/76; Jul. 12, 1977, 25626 A/77

Int. Cl.[2] B60T *11/28*

U.S. Cl. 60—589 **8 Claims**

1. Hydraulic master cylinder comprising a housing having a bore therewithin, a piston slidably mounted in said bore for separating a supply chamber connected to a fluid reservoir from a pressure chamber connected to a hydraulic utilization

device, said piston having a head adjacent to the pressure chamber with a radial shoulder thereon, a valve formed by an elastomeric annular ring mounted with radial play around the piston head, said ring being slidably and sealingly mounted in said bore and disposed with axial play between said radial shoulder and a stop means, said ring controlling fluid communication between the supply chamber and the pressure chamber through the engagement of one of its lateral radial contacting faces with said radial shoulder, said communication occurring when the piston occupies its rest position and interrupted when the piston is moved from its rest position, said ring having an annular resilient lip projecting from said ring toward said radial shoulder to define a non return valve permitting fluid communication between said supply chamber and said pressure chamber while in the rest position and preventing fluid flow from the pressure chamber toward the supply chamber while permitting fluid flow from the supply chamber toward the pressure chamber when the piston occupies a position away from its rest position and the pressure in the pressure chamber is larger than the pressure in the supply chamber, said lip being adjacent said one of the lateral contacting faces and projecting toward said radial shoulder beyond the plane of said one of the lateral contacting faces.

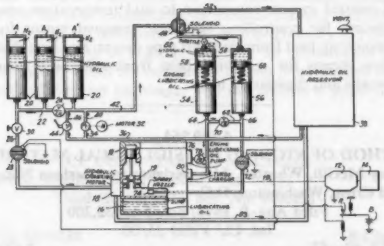


4,199,950

PRELUBRICATING AND LUBRICATING SYSTEMS FOR ENGINES

Alton L. Hakanson, 113-115 Monroe St., Hoboken, N.J. 07030, and Wilbur C. Schafer, 4 Brasser La., Kenilworth, N.J. 07033

Filed Dec. 1, 1977, Ser. No. 856,275
Int. Cl.[2] F01M *1/08, 1/12*
U.S. Cl. 60—605 **11 Claims**



1. In combination with a quick-starting fuel-burning engine having a running lubricating system and a sump and which has associated therewith a fluid energized rapid cranking system that includes:

(A) a fluid energizeable cranking motor,

(B) a stand-by source of fluid under pressure of from 250 to 10,000 psi,

(C) a first conduit connecting the source of fluid under pressure to the cranking motor,

(D) a normally closed valve in said conduit upstream of the cranking motor, and

(E) means for opening the valve when the motor is to be started, a prelubricating system that comprises:

(I) a chamber storing lubricating liquid,

(II) a second conduit connecting the source of fluid under pressure to said chamber,

(III) a valve in said second conduit which is normally closed,

(IV) means for opening the valve in said second conduit when the valve in the first conduit is opened to crank the engine whereby to pressurize the lubricating liquid,

(V) a spray nozzle in the engine sump, and

(VI) a third conduit connecting the lubricating liquid in said chamber with the spray nozzle,

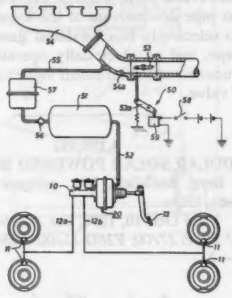
(VII) the pressure imposed on the lubricating liquid by the stand-by source of fluid under pressure being high enough when the engine is started to force lubricating liquid under pressure through the third conduit and out of the spray nozzle as a fine rapidly moving mist to essentially instantaneously reach all relatively movable engine parts and lubricate the same as the engine is cranked.

4,199,951

PNEUMATIC BRAKE BOOSTER

Mitsuyuki Horie, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 5, 1977, Ser. No. 857,460
Claims priority, application Japan, Jun. 22, 1977, 52/74185
Int. Cl.[2] F02G *3/00*; B60T *13/00*
U.S. Cl. 60—613 **2 Claims**



1. A pneumatic brake booster for a wheeled vehicle having an internal combustion engine, a brake pedal and a master cylinder, the booster comprising:

a source of positive fluid pressure;

a housing including an inlet port connected to said fluid pressure source;

a power piston reciprocable within said housing and being provided at one side thereof with a cylindrical body extending outwardly from said housing and at the other side thereof with an operating rod securely connected to the power piston and extending outwardly from said housing, said cylindrical body having an axial bore opening outwardly and said operating rod being operatively connected with said master cylinder;

a diaphragm member secured at the outer periphery thereof with the inner wall of said housing and at a radially inward portion thereof with said power piston to subdivide the interior of said housing into a positive pressure rear chamber and a variable pressure front chamber, said positive pressure chamber being in open communication with said inlet port and said variable pressure chamber being selectively communicated through said axial bore with

said positive pressure chamber and with atmospheric pressure;

a spring for biasing said power piston toward said positive pressure chamber;

a valve plunger axially movable within said axial bore and operatively connectable with said brake pedal for movement thereby between a released position and an actuated position, said valve plunger having a first annular valve seat located in said axial bore;

a valve body hermetically secured to the inner wall of said axial bore and having an annular valve part engageable with said first valve seat; and

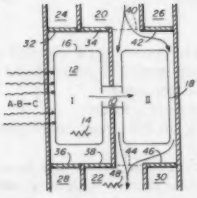
a second annular valve seat formed on an inner shoulder of said axial bore, the valve part of said valve body being in contact with said first valve seat in the released position of said valve plunger to communicate said variable pressure chamber with said positive pressure chamber through said axial bore and the valve part of said valve body engaging said second valve seat to isolate said positive pressure chamber from said axial bore upon movement of the valve plunger by the brake pedal toward the actuated position and thereafter said first valve seat separating from the valve part of said valve body to communicate said variable pressure chamber to the atmospheric pressure through said axial bore, whereby said power piston is actuated against the biasing action of said spring due to difference in pressure between said two chambers, and wherein said source of positive fluid pressure includes an accumulator connected to the inlet port of the housing; an exhaust pipe for connection to the engine, a bypass conduit between the exhaust pipe and the accumulator, a check valve in the bypass conduit to permit flow of exhaust gas from the exhaust pipe to the accumulator and to prevent reverse flow, a cutoff valve disposed within the exhaust pipe downstream of the bypass conduit connection to selectively block exhaust gases flowing through said pipe, and an electrically operated actuator operatively connected to said cutoff valve to open and shut said cutoff valve.

4,199,952

MODULAR SOLAR POWERED HEAT PUMP

Charles A. Berg, Buckfield, Me., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Oct. 10, 1978, Ser. No. 950,035
Int. Cl.[2] F25B *27/00*; F25D *15/00*; F25B *17/02, 17/08*
U.S. Cl. 62—2 **16 Claims**



1. A moldular unit powered primarily by solar radiation for heating and cooling a thermal sink, said unit being operable to execute an intermittent adsorption heat pump cycle and comprising:

A. a sealed tubular enclosure having a valve positioned to separate first and second chambers defined by opposite ends of the interior of said tube;

B. a tubular housing surrounding said first chamber, said housing being sealed to maintain a subatmospheric pressure zone between the tube and housing and being transparent to solar radiation;

C. a solid adsorbent material disposed in said first chamber;

D. a refrigerant comprising a condensible adsorbate contained within said enclosure;

E. means for thermally coupling a heat distribution system of the thermal sink to said chambers comprising first and second conduit sections for connection with fluid circulation conduits which communicate with the sink;

F. a first heat exchanger having a heat transfer surface within said first chamber in contact with said adsorbent material and a heat transfer surface in said first conduit section of said coupling means;

G. a second heat exchanger for exchanging heat between said second chamber and said second conduit section of said coupling means;

H. temperature and pressure sensors disposed within said first and second chambers; and

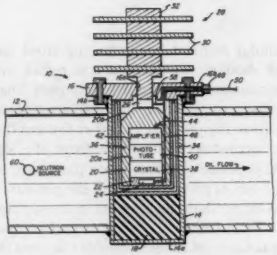
I. means for electrically coupling said sensors and the valve to a control.

4,199,953

TEMPERATURE STABILIZATION SYSTEM

Albert P. Richter, Jr., and Harold E. Peelman, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 19, 1978, Ser. No. 870,560
Int. Cl.[2] F25B *21/02, 19/00*
U.S. Cl. 62—3 **11 Claims**



1. A system for stabilizing the temperature of a radiation detector assembly comprising:

(a) heat pipe means, generally enclosing a radiation detector assembly whereby ambient heat is absorbed by said heat pipe means for effectively communicating the absorbed heat from said detector assembly to a heat removal means;

(b) temperature sensing means for detecting temperature at said heat pipe means;

(c) heat removal means comprising a thermo electric cooler for selectively removing heat from said heat pipe means;

(d) control means, responsive to said temperature sensing means, for controlling said heat removal means for so removing heat from said heat pipe means; and heat dissipation means for receiving heat from said heat removal means and dissipating heat.

4,199,954

METHOD OF STORING PHYSIOLOGICAL MATERIAL

Manley McGill, Wheaton, Md., assignor to American National Red Cross, Washington, D.C.

Filed Aug. 9, 1978, Ser. No. 932,200
Int. Cl.[2] F25D *25/00*
U.S. Cl. 62—62 **5 Claims**

1. In the method of storing a physiological material comprising a suspension or immersion of human cells or tissue in physiological solution at a basic storage temperature of about 4° C., the improvement consisting of a temperature cycling procedure which comprises periodically interrupting the 4° C. storage by subjecting said material to a higher temperature within the range of from 25° to 37° C. for a period of time and at intervals sufficient to inhibit the irreversible losses in function

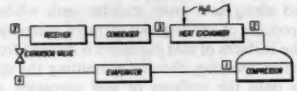
and viability of said cells or tissue which would otherwise occur with a continuous and uninterrupted 4° C. storage.

4,199,955

HEAT EXTRACTION OR RECLAMATION APPARATUS FOR REFRIGERATING AND AIR CONDITIONING SYSTEMS

Kjartan A. Jonsson, Ballston Lake, N.Y., assignor to Sun-Econ, Inc., Ballston Lake, N.Y.

Division of Ser. No. 736,004, Oct. 27, 1976, Pat. No. 4,089,667.
This application May 16, 1978, Ser. No. 906,508
Int. Cl.[2] F25B *7/00, 27/02*
U.S. Cl. 62—79 **3 Claims**



1. In a method for reclaiming the heat otherwise transferred to the atmosphere by the refrigerant in a conventional refrigeration or air conditioning system having acompressor, a condenser, and an evaporator, in which the refrigerant is caused to flow through a heat exchanger as it leaves the compressor but before it enters the condenser so as to transfer the heat in the refrigerant to a heat transfer medium also flowing through the heat exchanger, and in which the refrigerant as it leaves the compressor has a quantity of heat Q_1 available for reclamation defined by $Q_1=M_1[h_g{}^i-h_g{}^e+(1-X)\ h_{fg}{}^e]$, where M_1 is the mass flow rate of the refrigerant in the system, $h_g{}^i$ is the enthalpy of the refrigerant gas leaving the compressor, $h_g{}^e$ the enthalpy of the refrigerant gas leaving the heat exchanger, X the quality of the refrigerant as it leaves the heat exchanger, and $h_{fg}{}^e$ the difference in enthalpy between saturated liquid refrigerant and saturated vapor refrigerant leaving the heat exchanger, the refrigerant and the fluid transfer medium respectively flowing through separate flow paths in the heat exchnager in opposite directions, the dividing wall separating said first and second flow paths havng a surface area A and a heat transfer coefficient U, and the heat transfer medium being circulated through the second flow path with a mass flow rate M_2 and a predetermined velocity, the improvement comprising:

selecting the said surface area A and the said heat transfer coefficient U for said dividing wall in the heat exchanger and controlling the mass flow rate M_2 and velocity of the heat transfer medium through the second flow path such that the heat transferred to said heat transfer medium, when the inlet temperature of the heat transfer medium is at its expected minimum value, is proportionally so related to the quantity of heat Q_1 available for reclamation that the quality X oof the refrigerant exiting from the first flow path of the heat exchanger will not go below about 0.25.

4,199,956

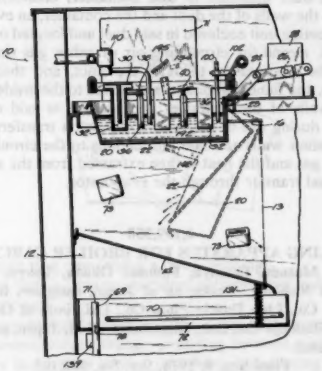
ICE CUBE MAKING MACHINE

Howard L. Lunde, Rte. 1, Oconto, Wis. 54153

Filed Oct. 4, 1978, Ser. No. 948,456
Int. Cl.[2] F25C *1/20*
U.S. Cl. 62—138 **8 Claims**

3. In an ice cube making machine including a frame, an evaporator including freezing elements positioned in an ice forming pan containing water to cause cube formation upon the elements, means for supporting the pan for movement between a freezing condition and a dumping position, including a harvest motor to move said pan between said positions, the improvement comprising paddle means for agitating the water contained in said pan, and means for oscillating the paddles between said freezing elements and in a rectilinear path to provide clear, uniform cubes of ice and wherein said means for oscillating said paddles comprises support rods connected to said paddles, bearing means for supporting said support rods, a cam follower connected to said rods, and an agitator motor having an output shaft with a cam engageable with said cam follower to reciprodate said rods during rotation of said motor output shaft and including sensing means including a feeler arm to sense the thickness of an ice cube on a freezing element, means for adjustably supporting said feeler arm on one of said support rods to afford movement of said feeler arm in a path toward and away from a freezing element, and means supporting said feeler arm to afford displacement of said feeler arm when the thickness of a cube reaches a predetermined thickness, a circuit and switch actuator means associated with the feeler arm for actuating switch means in said circuit to stop oscillation of said agitator motor and energize said harvest motor when an ice cube on a freezing element reaches a predetermined thickness.

7. In an ice making machine including a water freezing pan which is supported for movement between a freezing position and a displaced dumping position, a refrigeration system including an evaporator having freezing elements located in said pan for forming ice cubes thereabout, and said circuit including

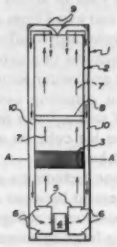


a motor to cause agitation of water in said pan and a harvest motor for displacing the pan from the freezing position to the dumping position, and valves for controlling the discharge of water to the pan and hot gas into the freezing element for release of cubes from the elements during the harvest cycle, the improvement including a control module housing said circuitry, said circuit having first, second and third proximity switches located within said module, a thickness sensor for measuring the buildup of ice on a freezing element, said sensor including a pivoted feeler arm having a first switch actuator which moves adjacent to one side of said module and cooperates with said first proximity switch to initiate the harvest cycle by energizing said harvest motor, a second switch actuator fixed to said freezing pan and movable adjacent another side of said module to cooperate with said second proximity switch to stop said harvest motor and initiate said agitating motor upon return of said pan to said freezing position, and wherein said ice making machine has an ice cube bin sensor to sense the quantity of accumulated cubes in said bin, a linkage connecting said sensor to a third switch actuator which cooperates with said third proximity switch to de-energize said refrigeration system when the desired cube accumulation has been obtained.

4,199,957
EVAPORATOR ASSEMBLY

David W. Richardson, Blairgowrie, and Colin Husker, Monifieth, both of Scotland, assignors to Harker Co., Ltd., Halifax, Nova Scotia, Canada

Filed Jun. 20, 1978, Ser. No. 917,354
Int. Cl.[2] F25D *21/06, 17/06*
U.S. Cl. 62—275 10 Claims

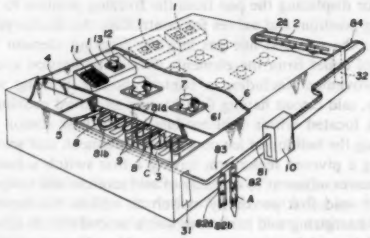


1. An evaporator assembly comprising a sealed thermally conductive container having rigidly connected and fixed side and end walls completely enclosing the interior of said container, a duct mounted in said container, channels formed between the walls of the duct and the container, an evaporator and defrosting unit enclosed in said duct and located out of said channels, means for circulating air or other gas through or across the evaporator, through the duct, and through the channels, and finned fabrications attached to the inside surfaces of the walls of the container and located in said channels, wherein during use of said assembly heat is transferred from the container walls and said fabrications to the circulating air or other gas and the heat is then extracted from the air or gas by thermal transfer through the evaporator.

4,199,958
CHILLING APPARATUS FOR BROILER CARCASSES

Katsumi Masuda, Ohmiya; Fumiaki Okada, Tokyo, and Yoshihiro Nishioka, Osaka, all of Japan, assignors to Daiken Kogyo Co., Ltd.; Daikin Plant Co., Ltd., both of Osaka and Ijichi Shukeijo Co., Ltd., Kagoshima, all of, Japan, part interest to each

Filed Sep. 6, 1978, Ser. No. 940,103
Claims priority, application Japan, Mar. 30, 1978, 53/37823
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—374 13 Claims

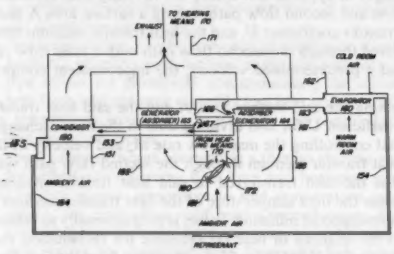


1. A chilling apparatus for broiler carcasses, including a chilling room having an inlet and an outlet; a conveyor for continuously conveying said broiler carcasses along an inner transfer path settled within said chilling room between the inlet and outlet of said chilling room; at least one air chilling unit for feeding cold air to chill said carcasses conveyed along said transfer path, said air chilling unit comprising a fan for circulating air and a heat exchanger for chilling the circulating air, and a water spray device for spraying water onto the surfaces of said carcasses in a process of chilling said carcasses; said conveyor comprising a rail, a plurality of shackles mounted movably to said rail, and drive means for moving said shackles, said rail being arranged endlessly across the inside and the outside of said chilling room through said inlet and outlet and above said shackles, said rail having a carcass loading station where said carcasses are loaded on said shackles and a carcass unloading station where said carcasses are removed from said shackles, said loading station being located on an outer transfer path and in the vicinity of said inlet of said chilling room, said unloading station being located on said outer transfer path and in the vicinity of said outlet, said water spray device having a plurality of spray nozzles, said nozzles being arranged within said chilling room so that said nozzles may spray water intermittently a plurality of times onto said carcasses which are being conveyed along said inner transfer path while being chilled in the process of chilling and transfer whereby water sprayed onto the surfaces of said carcasses is drained from said chilling room after spraying, thereby permitting the spraying of clean water onto the surfaces of said carcasses, so that repeated drying of said carcasses by cold air and moistening said dried carcasses occurs during the process of chilling and transferring said carcasses which are being conveyed along said inner transfer path, said water sprayed onto said carcasses from said nozzles being attached to the surface of said carcasses in an amount small enough to prevent said carcasses from being dried.

4,199,959
SOLID ADSORPTION AIR CONDITIONING APPARATUS AND METHOD

Jaroslav Wurm, North Riverside, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 780,692, Mar. 24, 1977, Pat. No. 4,138,861. This application Aug. 10, 1978, Ser. No. 932,443
The portion of the term of this patent subsequent to Feb. 13, 1996, has been disclaimed.
Int. Cl.[2] F25B *17/08, 29/00*
U.S. Cl. 62—480 25 Claims



1. A process for air conditioning comprising the steps: generating refrigerant by desorption from a solid adsorbent on the interior of a generator (adsorber) functioning as a generator by heating said generator while removing heat from a condenser in thermal insulated and valved communication with said generator causing said refrigerant to move in the vapor state to the condenser and to condense to a liquid state within the condenser; continuously expanding the liquid to an evaporator while applying heat to said evaporator by passing an ambient airstream in thermal exchange relation to said evaporator and removing heat from an adsorber (generator) functioning as an adsorber by passing an airstream to be heated in thermal exchange relation to said adsorber heating the airstream for introduction to an air conditioned space, said adsorber in thermal insulated and valved communication with said evaporator causing said refrigerant to vaporize and pass from the evaporator to the adsorber (generator) in the vapor phase and adsorb on said solid adsorbent on the interior of said adsorber which

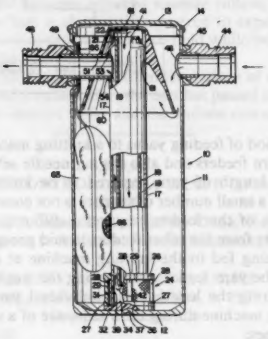
then becomes said generator (adsorber); and recycling said thermal condition sequence to provide desired conditioning to an air conditioned space.

4,199,960

ACCUMULATOR FOR AIR CONDITIONING SYSTEMS

Cecil L. Adams, Mayfield Heights., and Norman E. Warner, Hudson, both of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 26, 1978, Ser. No. 955,048
Int. Cl.[2] F25B *43/00*
U.S. Cl. 62—503 **20 Claims**



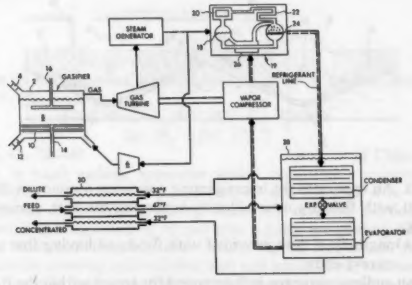
1. An accumulator for an air conditioning system comprising a container having an inlet and an outlet at its upper end, a first hollow member extending between the upper and lower ends of the container, a second hollow member within the first member and radially spaced therefrom to define a radial clearance therebetween, first means closing said clearance at the upper end of said first member, second means closing the lower end of said first member, a flow passage connecting the lower end of the second member with said clearance, a bleed port connecting the interior of the container with the interior of said first member, said second member being open at its upper end to the interior of the container, said outlet being connected to said clearance and leading from said clearance to the exterior of the container.

4,199,961

METHOD AND APPARATUS FOR CONTINUOUSLY FREEZING AND MELTING A FLUID MIXTURE

Larry D. Carter, Arvada, and Silas W. Clark, Golden, both of Colo., assignors to Roldiva, Inc.

Filed Feb. 13, 1978, Ser. No. 877,126
Int. Cl.[2] B01D *9/04*
U.S. Cl. 62—535 **23 Claims**



1. A method for continuously freezing a fluid mixture into a frozen fluid and melting said frozen fluid to produce a concentrated component and a dilute component, comprising:

gasifying coal to produce fuel for a gas turbine, providing, from said gas turbine, mechanical energy with heat by-product energy;

compressing refrigerant with said mechanical energy;

cooling said refrigerant with said heat by-product energy;

warming said frozen fluid to produce melted frozen fluid by condensing said refrigerant;

evaporating said refrigerant by absorbing heat from and freezing said fluid mixture to form said frozen fluid, and

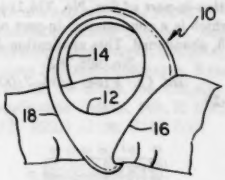
carrying out said condensing and said evaporating at temperatures within a narrow temperature range around the freezing temperature of the fluid mixture.

4,199,962

MULTIPLE-SIZED RING

Robert L. Ambrose, New York, N.Y., assignor to Anthony H. Handal, New York, N.Y., a part interest

Filed Jul. 27, 1978, Ser. No. 928,605
Int. Cl.[2] A44C *9/00, 9/02*
U.S. Cl. 63—15 **8 Claims**



6. A finger ring comprising a body defining:

(a) a first finger passage extending between first and second orifices; and

(b) a second finger passage distinct from said first passage, said second finger passage extending between said second orifice and a third orifice, said third orifice being smaller than said second orifice and said second passage being smaller than said first passage, said first, second and third orifices being positioned peripherally on said body.

4,199,963

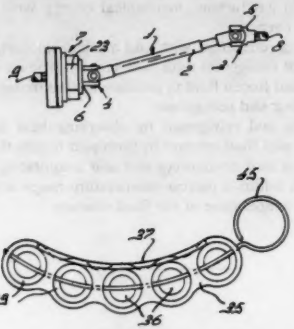
OVERLOAD COUPLINGS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Jan. 26, 1978, Ser. No. 872,545
Claims priority, application Netherlands, Feb. 1, 1977, 7701012
Int. Cl.[2] F16D *3/56, 7/00*
U.S. Cl. 64—28 R **33 Claims**

1. An overload coupling comprising a first member and a second member that are drivenly interconnected by fragible means for rotation together about a common axis during normal operation, said fragible means comprising at least one fragible pin that interconnects the coupling members and said pin being fitted in cutting means that severe the pin upon overload to permit relative rotation between said members,

means urging said fragible means into said cutting means to re-establish an interconnection between said coupling mem-



bers, said pin being supported in a holder connected to the coupling by a quick-action connection.

4,199,964

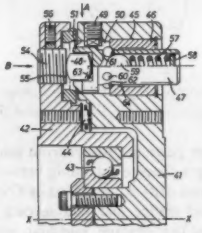
THRUST TRANSMISSION OR THRUST PRODUCING DEVICE

John C. Grey, 30 Osterley Ct., Osterley, Middlesex, England

Continuation-in-part of Ser. No. 774,214, Mar. 3, 1977, abandoned, which is a continuation-in-part of Ser. No. 549,338, Feb. 12, 1975, abandoned. This application Jun. 13, 1977, Ser. No. 805,782

Int. Cl.[2] F16D *3/56, 7/00*

U.S. Cl. 64—29 **11 Claims**



1. A torque transmission device comprising rotary input and output members having a common axis of rotation, at least one pair of rolling elements of substantially equal diameter in coupling engagement with the members for transmitting a torque between the input and output members while corotating therewith, the two rolling elements of said at least one pair of rolling elements being disposed in tandem in relation to the direction of rotary movement of the members whereby the transmitted torque load is applied in series to the elements of a pair, a line joining the rolling centers of the elements of the or each pair of elements extending parallel to the line of movement of the members normal to the axis of rotation of the members, a contact location between at least one of the rolling elements and one of the members through which the torque load of said element is transmitted, said contact location being at a position on the periphery of said one element that is offset from said center-joining line in the direction of the axis of rotation and that is located on a radius of said one element that is oblique to said center-joining line, whereby the transmission of the torque load produces an axial force component on said one element, resiliently displaceable means acting on said one element for retaining the elements in coupling engagement with the members.

4,199,965

YARN FEED CONTROL SYSTEM

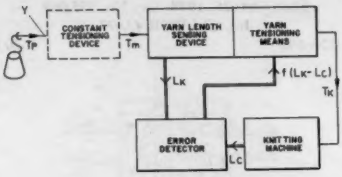
Peter Wilson, Redhill, England, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

Filed Aug. 15, 1977, Ser. No. 824,702

Claims priority, application United Kingdom, Aug. 16, 1976, 34031/76

Int. Cl.[2] D04B *15/48*

U.S. Cl. 66—125 R **15 Claims**



1. A method of feeding yarns to a knitting machine having a group of yarn feeders and also having needle selecting means so that the length of yarn required to be knitted into each sequence of a small number of stitches is not constant, wherein one or more of the feeders requires a different and varying yarn feed rate from the other feeders in said group the individual yarns being fed to the knitting machine at an adjustable tension by the yarn feeders, comprising the steps of:

(1) measuring the length of an individual yarn fed to the knitting machine during each sequence of a small number of stitches;

(2) comparing the measured length to a pedetermined length value which is a function of a predetermined stitch length;

(3) adjusting the tension in said individual yarn fed to said knitting machine in response to any deviation detected in comparison step (2) above; and

(4) maintaining said adjusted tension while repeating steps (1) and (2) and then repeating step (3) in response to the deviation detected during the repetition of steps (1) and (2) so as to continuously adjust the tension of said yarn fed to the knitting machine so that the actual yarn consumption in the knitting of an article is substantially equal to the predetermined yarn consumption.

4,199,966

IMPREGNATOR/RINSER

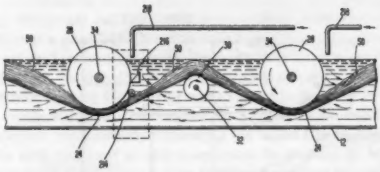
Allen R. Winch, Westfield, N.J., assignor to Cotton Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 859,167, Dec. 9, 1977. This application Apr. 23, 1979, Ser. No. 32,406

The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.

Int. Cl.[2] D06B *3/02*

U.S. Cl. 68—22 R **16 Claims**



1. An apparatus for impregnating a moving nonwoven fiber batt with fluid by intermittently squeezing the batt, comprising:

a longitudinal tank provided with fluid and having first and second ends;

an endless conveyor belt arranged for travel within the fluid of the tank between the first and second ends of the tank

in a generally longitudinal direction, the belt carrying the fiber batt through the tank with the batt always located on the upper surface of the belt;

a series of squeeze rollers arranged within the longitudinal tank, the endless conveyor belt carrying the batt between the belt and each squeeze roller to define a nip between each of the squeeze rollers and the endless conveyor belt to thereby expel fluid from the batt;

a series of singular rollers arranged within the longitudinal tank, with an uppermost portion of each singular roller being vertically above and between lowermost portions of adjacent squeeze rollers with the endless belt traveling on each singular roller with the belt between the batt and the singular roller to thereby allow the batt to expand and absorb fluid between adjacent squeeze rollers;

whereby the batt is alternately squeezed to expel fluid and then allowed to expand to absorb fluid while being carried through the tank of fluid; and,

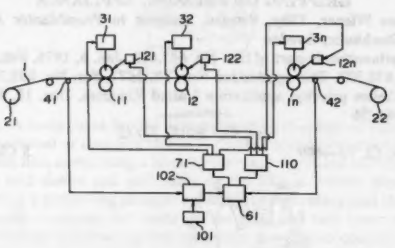
means for removing the batt from the surface of at least one of the squeeze rollers after the batt has passed through the nip of the squeeze roller and the endless conveyor belt.

4,199,967

METHOD OF CONTROLLING A SHAPE OF A ROLLED SHEET

Shinichi Ikemi, Amagasaki, and Koichi Ohba, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1978, Ser. No. 958,393
Claims priority, application Japan, Nov. 9, 1977, 52/134917
Int. Cl.² B21B *37/06*
U.S. Cl. 72—12 **3 Claims**



1. A method of controlling a shape of a rolled sheet in a tandem type rolling mill which comprises detecting tension distributions of the sheet in the transversal direction, between a pay-off reel and a first stand and between a last stand and a tension reel by a first and second shape meters; and controlling each roll bending force or each distribution of a roll coolant at the last, first and other stand so as to give a desired pattern of forward slip and backward slip in the transversal direction as sums of tension distributions detected by said first and second shape meters.

4,199,968

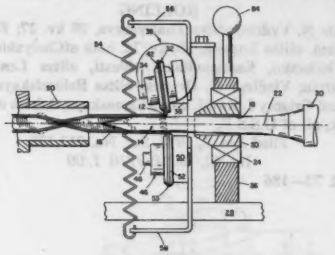
BAND MAKING APPARATUS

John H. Mardirossian, Warwick, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 13, 1978, Ser. No. 959,994
Int. Cl.² B21C *37/12*
U.S. Cl. 72—49 **9 Claims**

1. In band making apparatus which comprises a mandrel having an axis, means for supplying to said mandrel wire of U-shaped cross-section having relatively inverted portions alternating longitudinally of said axis, a guide for guiding said wire onto said mandrel, and variable speed mechanism for relatively rotating said mandrel and said guide about said axis and for relatively reciprocating said mandrel and said guide longitudinally of said axis in a controlled speed ratio such that the wire is wound on said mandrel with a side edge of alternately inverted portions interengaged in the channel of the other;

the improvement wherein said guide has a guide surface arranged to engage the external surface of the side edge of



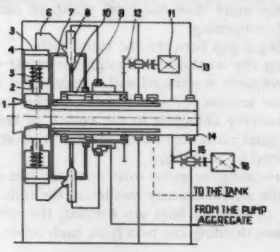
the wire incoming to the mandrel, bias means are provided for urging said guide toward the axis of the mandrel, and said ratio is such that the back pressure of previously wound turns of wire on said mandrel maintains said surface of said incoming wire against said guide surface.

4,199,969

TUBE SWAGING MACHINE

Zbigniew Engel, Wieliczka; Marek Kepiński, Sosnowiec, and Idzi Grabowski, Bytom, all of Poland, assignors to Osrodek Badawczo-Rozwojowy Maszyn Hutniczych, Bytom, Poland

Filed Jan. 25, 1978, Ser. No. 872,458
Claims priority, application Poland, Feb. 3, 1977, 195832
Int. Cl.² B21D *31/06*; B21J *7/16*
U.S. Cl. 72—76 **6 Claims**



1. A tube swaging machine, particularly a machine for swaging ends of tubes for forging objects of substantially round sections, comprising: hammer means radially arranged relative to a workpiece; hydraulic power cylinder and piston means; said piston means being fixed to said hammer means, said piston means having a piston rod mounting spring means for providing a return stroke of the piston; vibrating generator means; conduit means connecting said hydraulic power cylinder to said generator means; said vibration generator means rotating relative to said workpiece; a housing with bearings; a rotary central shaft mounted in said bearings in said housing and carrying said vibration generator; motor means with transmission means; said central shaft being driven through said transmission means by said motor means, said hammer means being hydraulically driven through an impulse generated by said vibration generator means and transmitted by working fluid, said vibration generator means having nozzles into which the working fluid is pumped, parts of said nozzles on an outflow port side thereof being screened periodically by means on said auxiliary shaft, flow of working fluid occurring

through conduits into hydraulic power cylinders at the instant that the outflow port is screened for advancing movement of said hammer means on said piston means.

4,199,970

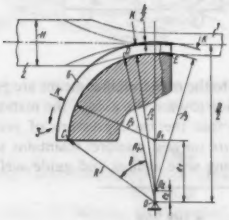
METHOD AND MILL ROLLS FOR METAL BAR ROLLING

Vladimir N. Vydrin, ulitsa Timiryazeva, 28 kv. 27; Evgeny N. Berezin, ulitsa Engelsa, 28, kv. 72, both ofChelyabinsk; Oleg I. Tischenko, Karagandinkoi oblasti, ulitsa Lenina, 6/3, Temirtau; Vladimir G. Dremin, ulitsa Beloretskaya, 70, kv. 22, and Grigory I. Koval, ulitsa Estonskaya, 2, both of Chelyabinsk, all of U.S.S.R.

Filed Jun. 7, 1978, Ser. No. 913,330

Int. Cl.[2] B21B *1/10, 1/00*

U.S. Cl. 72—186 **5 Claims**



1. A method for metal bar rolling a workpiece having a longitudinal axis, using a pair of shaped metal rolls defining therebetween a plurality of substantially closed passes, adjacent passes being off-set from each in a direction perpendicular to the longitudinal axis of a workpiece passing through the rolls, the workpiece having a cross sectional area equal to at least the sum total of cross sectional areas of finished bars formed by the closed passes and the width of the workpiece being not more than the total width of closed passes, said method comprising:

forming a gap between the metal rolls;

passing the workpiece through the metal rolls so that the workpiece is reduced and a transitional zone of variable cross section is formed in the workpiece, the zone progressively changing in the course of reduction from an original cross section to several cross sections interconnected by webs; and

reciprocating the metal rolls along the axis of the workpiece while simultaneously oscillating the rolls so that a plurality of finished bars are formed, the off-set of adjacent passes dividing the bars from each other.

4,199,971

METHOD FOR THE MANUFACTURE OF PROFILED REED BLADES FOR LOOM REEDS

Fritz Kielersreiter, Tann-Rüti, Switzerland, and Hubertus H. Rouleaux, Venlo, Netherlands, assignors to Rüti Machinery Works Ltd., Ruti, Switzerland and Ruti-Te Strake B.V., Deurne, Netherlands

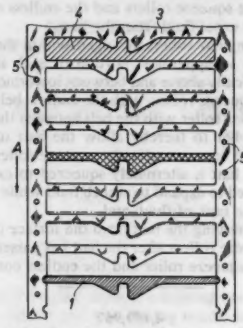
Filed Oct. 25, 1977, Ser. No. 845,131

Claims priority, application Switzerland, Oct. 28, 1976, 013583/76; Sep. 20, 1977, 011469/77

Int. Cl.[2] B21D *28/00*

U.S. Cl. 72—336 **10 Claims**

1. A process for forming finished trued profiled reed blades for loom reeds from strip material having a thickness corresponding to the thickness of the finished blade in which the reed blades are stamped from the strip material longitudinally parallel and spaced from each other, characterized by the fact that the reed blades are firmly connected at their ends to the strip until a final process step, are finished in this condition to the final product ready for use and are obtained as individual reed blades only after completion of the final process step, whereby in a first processing step strip regions between the lengthwise edges of the individual reed blades are punched out followed by treatment processing steps of the edges formed by the stamping which includes an embossing step, a trueing step, and a polishing step, all process steps for the forming of the



reed blades except the final step being carried out on the blades while connected at their longitudinal ends to the strip material, to maintain trueness and in the said final processing step, the longitudinal ends of each reed blade are separated from the strip to form the finished profiled trued reed blade.

4,199,972

GRIPPING OR PRESSING APPLIANCE

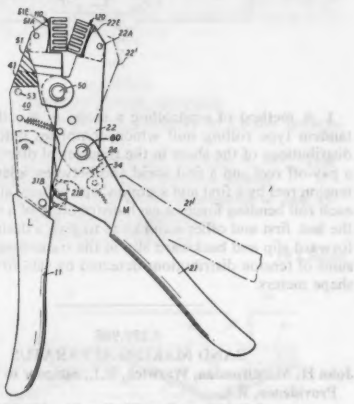
Hans Wiener, Täby, Sweden, assignor to PressMaster A.B., Stockholm, Sweden

Continuation-in-part of Ser. No. 647,641, Jan. 8, 1976, Pat. No. 4,078,303. This application Nov. 18, 1977, Ser. No. 852,724

Claims priority, application United Kingdom, Dec. 15, 1976, 52366/76

Int. Cl.[2] B21D *37/12*

U.S. Cl. 72—409 **5 Claims**



1. A tool for handling workpieces of generally circular cross-section, comprising a first jaw and a second jaw each having a base provided with workpiece-gripping projections, and operating means including a pair of pivotally interconnected shanks enabling relative swinging of said jaws in a plane transverse to the pivotal axis between a withdrawn position allowing insertion of a workpiece between said jaws and a working position in which the projections of said jaws are mutually interleaved, said jaws being swingably mounted on

said shanks with swing axes parallel to said pivotal axis for facilitating the interleaving of their projections upon approaching said working position; said shanks being provided with respective backing surfaces disposed between said swing axes and said jaws for engaging the bases thereof at least in said working position.

4,199,973

TWO-ARMED LEVER PRESS

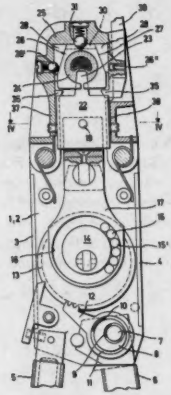
Friedrich-Günther Laux, Alt-Moabit 19, 1000 Berlin 21, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,362

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1978, 2817888

Int. Cl.[2] B21D *7/06*

U.S. Cl. 72—410 **13 Claims**



1. A lever press for the non-soldered connection of a metallic terminal or coupling sleeve to an electrical cable, conductor or the like, comprising a housing carrying die means for receiving said sleeve and said cable or the like, a presser plunger having a projecting plunger mandrel for deforming said sleeve to grip it against the cable or the like, and two lever arms carried on said housing and relatively movable to operate said plunger, wherein said die means is a removable die block which substantially wholly embraces the sleeve during the pressing operation, said die block having an opening therethrough sized to receive said plunger mandrel.

4,199,974

EOLIAN SAND TRAP

Steven G. Fryberger, Golden, and Thomas S. Ahlbrandt, Lakewood, both of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Sep. 15, 1978, Ser. No. 942,847

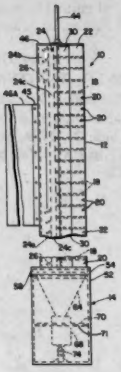
Int. Cl.[2] G01N *1/04, 1/22*

U.S. Cl. 73—28 **7 Claims**

1. A trapping and measuring device for wind borne particles of sand, said device comprising:

a housing including trapping means for permitting wind to pass therethrough while trapping sand borne by the wind, said trapping means including means defining an entrance opening through which the sand-bearing wind enters said housing, exit means for providing an exit through which the wind can pass from said housing and baffle means positioned between said opening and said exit means for intercepting the wind during the travel thereof between said opening and said exit means to thereby promote release of the sand particles from the wind, said baffle means including a pair of straight, slanted baffle plates located rearwardly of said entrance opening on opposite sides of the means defining said entrance opening so as to define a pair of said exits;

collecting means for collecting sand trapped by said trapping means; and



weighing means for weighing the sand collected by said collecting means and providing an output in accordance therewith.

4,199,975

METHOD AND APPARATUS FOR LOCATING A DEFECTIVE TUBE OF A LIQUID METAL-TO-WATER TUBE TYPE HEAT EXCHANGER

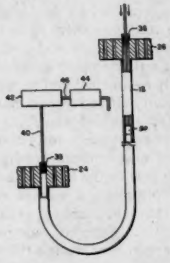
Steven L. Schrock, Greensburg, and James D. Mangus, Hempfield Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 676,179, Apr. 12, 1976, abandoned.

This application Sep. 29, 1978, Ser. No. 946,973

Int. Cl.[2] G01M *3/20*

U.S. Cl. 73—40.7 **19 Claims**



1. A method of detecting the location of a tube leak position in a liquid-metal-to-water tube type heat exchanger having a plurality of tubes wherein liquid metal contacts one surface of said tubes and water contacts the other surface of said tubes, and wherein mingling of said liquid metal and water forms a reaction product, comprising the steps of:

a. draining both the liquid metal and water from said heat exchanger;

b. introducing an inert gas to the outer surface of said tubes;

c. providing a pressure differential across the wall of said tubes wherein the pressure on the inner surface of said tubes is less than the pressure on the outer surface of said tubes;

d. heating the tubes to a temperature at which said reaction product breaks down whereby the inert gas and reaction

product mixture goes into said inner surface of said tubes wherever a leak in the tube occurs and said liquid metal and water mingle to form said reaction product;

e. isolating the chemical content of the interior of each of said tubes; and

f. analyzing said chemical content.

4,199,976

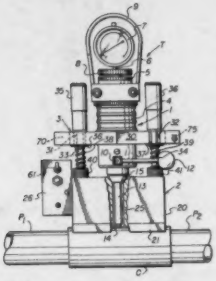
HARDNESS TESTING APPARATUS

John C. Edward, Beaumont, Tex., assignor to J B Development Corporation, Beaumont, Tex.

Filed Sep. 21, 1978, Ser. No. 944,548

Int. Cl.[2] G01N 3/48

U.S. Cl. 73—81 **9 Claims**



1. Apparatus for testing hardness properties of materials comprising:

a mounting assembly;

a head assembly attached to said mounting assembly having a shaft member with a penetrator on one end thereof for engagement with said material to be tested and mounted for limited axial movement from a first position to a second position in response to predetermined loads applied thereto;

actuator means connected to said shaft member for applying said predetermined loads thereto;

indicator means carried by said head assembly and responsive to said axial movement of said shaft means to measure the hardness of said material; and

an electromagnetic clamping assembly to which said mounting assembly is attached and by which said apparatus may be magnetically affixed to said material to be tested, holding said head assembly in a fixed relationship therewith, said electromagnetic assembly comprising an electromagnet disposed in a housing having a first elongated pole along a first side of the base of said housing and a second elongated pole along a second side of the base of said housing so that when said apparatus is attached to tubular material for testing thereof, said poles are in contact with said tubular member through the length of said housing.

4,199,977

INSTALLATION FOR THE CONTINUOUS MEASUREMENT OF THE FUEL CONSUMPTION OF INTERNAL COMBUSTION ENGINES

Wolfgang Hilpert, Stuttgart; Gerhard Komander, Altbach, and Manfred Stotz, Aichwald, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

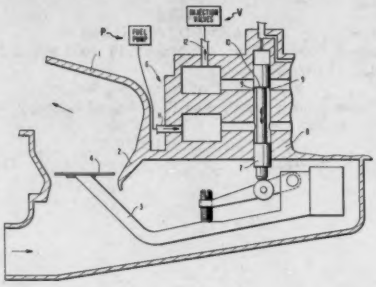
Filed Jun. 23, 1978, Ser. No. 918,451

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1977, 2728201

Int. Cl.[2] G01M 15/00

U.S. Cl. 73—119 A **11 Claims**

1. An installation for a continuous measurement of fuel consumption of internal combustion engines provided with fuel injection nozzles, the installation comprising a fuel-metering means for determining a quantity of fuel passed through the installation as a function of displacement thereof from a normal position, characterized in that a displacement pick-up means is operatively connected with the fuel metering means, the pick-up means includes a piston for controlling the amount of fuel flowing to the injection nozzles through a fuel distributor



means and for producing an analog signal corresponding to a deflection of the fuel-metering means from the normal position, and in that an instrument means is operatively connected with the pick-up means for providing an indication of the fuel consumption in response to the signal produced by the pick-up means, said instrument means is arranged within a field of vision of an operator of the internal combustion engine.

4,199,978

METHOD AND APPARATUS FOR MEASURING MECHANICAL FORCES ON MACHINE OR SUPPORT ELEMENTS

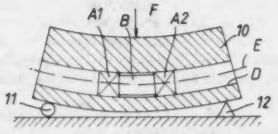
Folke von Knorring; Sven F. Lindkvist, and Lars S. Valdemarsson, all of Vasteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Aug. 25, 1978, Ser. No. 936,769

Claims priority, application Sweden, Aug. 25, 1977, 77095362

Int. Cl.[2] G01L 1/12

U.S. Cl. 73—133 R **10 Claims**



1. A method for measuring the resultant normal component of loading forces acting substantially perpendicular to the longitudinal axis of machine elements, comprising the steps of:

inserting and clamping a transducer in a continuous hole extending substantially along the longitudinal axis of the machine element so that the tangential points of two tangents of an elastic line in the wall of said hole are located symmetrically with respect to a symmetry plane of the loading forces; and

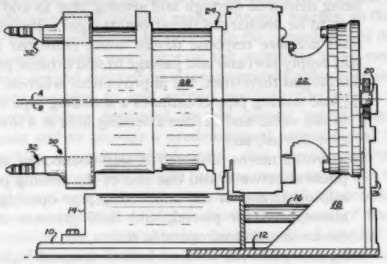
measuring the change of the angle between said two tangents.

4,199,979

TEST STAND

Charles H. Herr, Jr., Peoria, and Alan L. McLees, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 19, 1978, Ser. No. 907,455
Int. Cl.[2] G01L 5/13
U.S. Cl. 73—134 7 Claims



1. A test stand comprising:

a base;

a dynamometer having a rotary input member mounted on said base for movement such that said input member may be advanced toward or retracted from a mechanism to be tested;

a coupling carried by said input member and having two axially extending, generally radially spaced, teeth adapted to couple with a sprocket on the mechanism to be tested; and

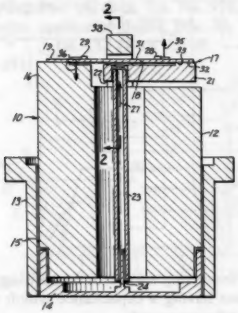
means for simultaneously adjusting the radial spacing of said teeth so that said dynamometer may be coupled to sprockets of differing sizes.

4,199,980

FOLDED BEAM STRUCTURE UTILIZATION METHODS AND APPARATUS

Ronald Bowman, Laguna Beach, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Oct. 30, 1978, Ser. No. 955,853
Int. Cl.[2] G01L 5/00
U.S. Cl. 73—141 A 44 Claims



9. A method of translating a force into a pair of oppositely acting moments up to a limited magnitude of said force, comprising in combination the steps of:

providing a folded beam structure with a first leg presenting a first end of the folded beam structure, and a second leg shorter than said first leg and presenting a second end, spaced from said first end, of the folded beam structure;

said first leg being provided with a first width;

said second leg being provided with a second width wider than said first width;

maintaining said first end stationary relative to said second end of the folded beam structure;

applying said force to said second end of the folded beam structure, moving said second leg with said applied force and imposing on said first leg with said applied force and moving second leg a first moment acting in a first portion of said first leg on one side of said second end and a second moment acting oppositely to said first moment in a second portion of said first leg on another side of said second end; and

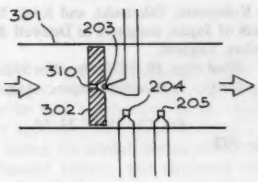
preventing overloading of said first leg by providing a stop with shoulder portions and with a groove extending between said shoulder portions, being wider than said first width, narrower than said second width and deeper than a travel of said first leg, permitting said first leg to extend in part through said groove with said first width located between said shoulder portions, and stopping the travel of said second leg with said shoulder portions against movement of said second leg by said applied force.

4,199,981

FLOW CONTROL DEVICE FOR FLUIDS FLOWING IN A CLOSED CONDUIT

Wen Young, 20228 Valerio, Canoga Park, Calif. 91306

Division of Ser. No. 769,181, Feb. 16, 1977, Pat. No. 4,099,700.
This application May 15, 1978, Ser. No. 906,218
Int. Cl.[2] G01F 1/68
U.S. Cl. 73—204 3 Claims



1. A flow sensing device comprising flow sensing means in a closed channel, including

a nozzle plate, constructed from a rigid, thermally insulating material, affixed in said closed flow channel;

a nozzle with a divergent axit channel for producing jet fluid flow, piercing said nozzle plate;

a first temperature-sensitive electrical resistor element mounted centrally in said divergent exit channel, exposed to said jet on the downstream side of said nozzle;

a second temperature-sensitive electrical resistor element remote from said nozzle

a bridge circuit incorporating said first temperature-sensitive element on one leg thereof and said second temperature-sensitive element in another leg thereof

a detector circuit, connect across said bridge circuit; said detector circuit including a third temperature-sensitive element remote from said nozzle to compensate for any temperature change in said channel, and

amplifier means, connected to said detector circuit, for amplifying the signal in said detector circuit.

4,199,982

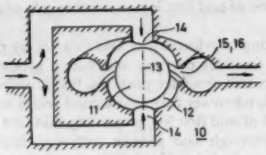
LIQUID FLOWMETERS

William A. Wemyss, Great Missenden, England, assignor to Sheila Mary Wemyss, Great Missenden, England

Filed May 26, 1978, Ser. No. 909,640
Claims priority, application United Kingdom, Jun. 2, 1977, 23459/77
Int. Cl.[2] G01F 1/05
U.S. Cl. 73—229 20 Claims

1. A fluid flowmeter comprising a chamber, a rotor adapted

and arranged to be rotated in said chamber about a predetermined axis of said chamber by flow of fluid therethrough, the fluid entering the chamber in use at or near both poles of the axis in a plurality of separate flows parallel to and including the polar axis of said rotor and leaving the chamber at an equatorial region of the chamber relative to said axis, said rotor being



adapted to be supported in the chamber solely by fluid flow and being provided with flow channels on or in the rotor for inducing rotation of the rotor, said flow channels being adapted to maintain or tending to maintain the rotor in a predetermined orientation relative to the axis of the chamber during use, and means for sensing the rate or amount of rotation of the rotor without physical content therewith.

4,199,983

APPARATUS FOR DETECTING THE LEVEL OF LIQUID IN A TANK

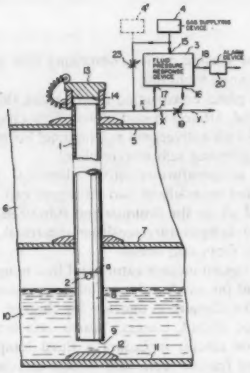
Shozaburo Kobayashi, Takatsuki, and Kenji Yamauchi, Yokohama, both of Japan, assignors to Dodwell & Company Limited, London, England

Filed Aug. 10, 1978, Ser. No. 932,424

Claims priority, application Japan, Aug. 22, 1977, 52-112101[U]

Int. Cl.[2] G01F *23/14*

U.S. Cl. 73—302 **9 Claims**



1. In an apparatus for detecting the level of liquid preferably fuel oil in a fuel oil storing tank in a vessel to control the quantity of fuel oil in the tank for use with an alarm device, comprising

a sensing pipe having a top portion closed and a lower portion inserted into said tank,

a connecting pipe communicating with said sensing pipe at one end thereof, the other end thereof being open to the atmosphere,

a fluid pressure response device defining a supply port, and exhaust port, a sensing port and an output port, and including a passage communicating said supply port with said exhaust port, said sensing port being connected to said connecting pipe at one end thereof, said output port being operatively connected to an alarm device, and

gas supplying means communicating with said sensing pipe and communicating with said fluid pressure response device through said supply port, for continuously supplying gas to said sensing pipe and to said fluid pressure response device, the gas supplied to said sensing pipe being delivered through said sensing pipe to said exhaust port to be discharged therefrom, the gas supplied to said fluid pressure response device being delivered through said supply port and said passage to said exhaust port to be discharged therefrom, the improvement wherein:

(a) said sensing pipe constitutes a sounding pipe disposed in the vessel and defines a sensing hole at a lower portion thereof, and

(b) throttle means, disposed in said connecting pipe at a position between said one end of the sensing port and said other end of the connecting pipe opening to the atmosphere, for placing said fluid pressure response device in a desired operable state,

whereby, when the level of fuel oil is raised higher than the level of said sensing hole, the pressure in said sounding pipe is increased and when the pressure in said sounding pipe reaches a value at which said fluid pressure response device is placed in a desired operable state, means for causing said fluid pressure response device to close said passage in response to said pressure to cause the gas to flow from said supply port to said output port to operate the alarm device, said throttle means for adjusting said pressure thereby to detect the level of fuel oil in said tank above said sensing hole.

4,199,984

CAPACITIVE MEASURING APPARATUS

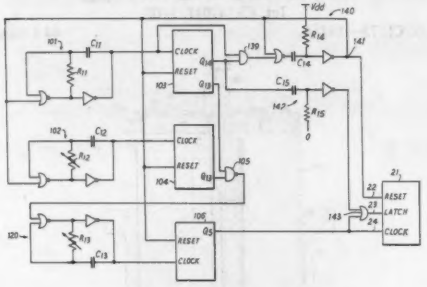
John Huddart, and Robin Huddart, both of 4 Ingleside Grove, London SE3 7PH, England

Filed Mar. 9, 1978, Ser. No. 884,738

Claims priority, application United Kingdom, Mar. 14, 1977, 10597/77

Int. Cl.[2] G01F *23/26*

U.S. Cl. 73—304 C **6 Claims**



1. Capacitive measuring apparatus comprising:

capacitor means having a capacitance which varies with a parameter to be measured;

first multivibrator means which so includes said capacitor means that the repetition rate thereof is consequently varied in an inverse manner with the capacitance of said capacitor means;

pulse counting means coupled to said first multivibrator means to receive pulses generated in the multivibrator means;

resetting means coupled to said counting means to be triggered by an output of said counting means when a predetermined number of the said pulses has been counted so that a train of resetting signals are generated separated by

intervals the length of which is a measure of the capacitance of said capacitor means;

measuring pulse generating means for generating measuring pulses of fixed repetition rate being coupled to said resetting means to be gated by the resetting signals to produce batches of measuring pulses;

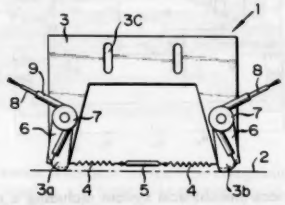
digital display means for displaying a reading representative of the number of pulses in each of the said batches, so that the display number is dependent on the capacitance of the capacitor means and hence on the parameter to be measured; second multivibrator means; second pulse counting means coupled to said second multivibrator means to receive pulses generated in said second multivibrator means and to provide a predetermined output signal on reaching a predetermined count, said second counting means being coupled to said resetting means to be reset by said resetting signals; and said measuring pulse generating means comprising a third multivibrator means of fixed repetition rate and third pulse counting means coupled to said third multivibrator means to receive pulses generated in said third multivibrator means in intervals each starting at the occurrence of said predetermined count in said second counting means and ending substantially at the occurrence of a resetting signal generated by said resetting means, said third counting means being coupled to said resetting means and being adapted to provide said measuring pulses, each said batch occurring in a respective one of said intervals starting at the occurrence of said predetermined count.

4,199,985

TEMPERATURE DETECTING DEVICE FOR IMAGE FIXING APPARATUS OF ELECTROSTATIC RECORDING APPARATUS

Noriyoshi Tarumi, and Kenji Ueno, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1978, Ser. No. 970,638
Claims priority, application Japan, Dec. 30, 1977, 52-176151
Int. Cl.[2] G01K *13/08*
U.S. Cl. 73—351 **1 Claim**



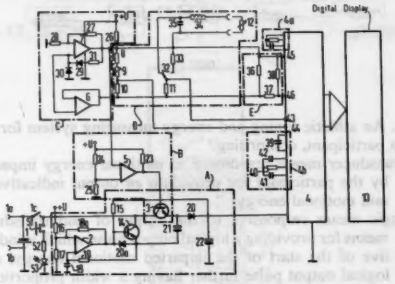
1. A temperature detecting device for heating image fixing means to be used in electrostatic recording apparatus, comprising a mounting member having a pair of dependent legs, adapted to be attached to the electrostatic recording apparatus, heat resistant insulating material covering said legs, an electric temperature detecting element, and a pair of electrically conductive elements each connected at one end to said temperature detecting element and supported at their other end by the insulated legs of said mounting member for resiliently holding said temperature detecting element spaced from but adjacent the heating surface of the image fixing means.

4,199,986

MEDICAL THERMOMETER COMPRISING A DIGITAL DISPLAY DEVICE FOR DISPLAYING THE TEMPERATURE VALUE OF THE BODY TEMPERATURE

Michael Ganslmeier, Grafenhaun, and Horst Wuenschmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1978, Ser. No. 971,700
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1977, 2757124
Int. Cl.[2] G01K *7/16*
U.S. Cl. 73—362 AR **2 Claims**



1. A thermometer comprising a digital display device for displaying the temperature value of the body temperature, a thermometer probe with a thermistor as the electric sensing element and an apparatus connected electrically therewith, said apparatus having the digital display device and an electronic circuit housed therein, said electronic circuit being operative for converting the resistance value of the thermistor which is a function of the temperature of the body, into the digital display, and a voltage source, characterized in that the electronic circuit comprises the following:

(a) a voltage multiplier (A) fed by the voltage source (1) and comprising an operational amplifier (2) and a cutoff transistor (3) for supplying a supply voltage;

(b) an integrated circuit (4) comprising a complete multidigit-voltmeter comprising an analog-to-digital converter, pulse counter, decoder, display editing and circuit elements (4*a* and 4*b*), which determines the method of operation and the measuring range of the integrated circuit (4); said integrated circuit (4) receiving the supply voltage from said voltage multiplier (A);

(c) a control circuit (B) serving the purpose of monitoring the voltage source (1), comprising an operational amplifier (5) controlling said cutoff transistor (3) and responsive in the case of a battery voltage which is too low for the temperature measurement, to switch off the transistor (3) and thus to interrupt the supply voltage for the integrated circuit (4);

(d) a network (C) comprising two operational amplifiers (6, 7) for generating a highly constant voltage, which serves as a reference voltage for the integrated circuit (4) and also as a feed voltage;

(e) a bridge circuit (D) receiving said feed voltage and comprising four highly constant resistances (8, 9, 10 and 11) and the thermistor (12) connected as a temperature sensor;

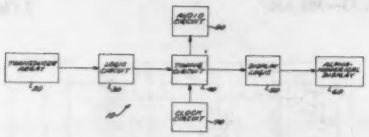
(f) a network (E) for adapting the voltage generated by the bridge circuit (D) to the reference voltage necessary for the integrated circuit (4); and

(g) the display device (13) being directly operated by the integrated circuit (4).

4,199,987
ELECTRONIC SYSTEM FOR MEASURING TIME, IMPACT ENERGY AND OTHER ATHLETIC PARAMETERS

William R. Bauers, 2802 N. Bristol St., Apt. No. 43, Santa Ana, Calif. 92706; Paul Mioduski, and Claude R. Ceccon, both of Tucson, Ariz., assignors to William Roy Bauers, Santa Ana, Calif.

Filed Nov. 30, 1978, Ser. No. 965,103
Int. Cl.[2] B01L 5/02
U.S. Cl. 73—379 11 Claims



1. An athletic timing and energy measuring system for use by a participant, comprising:

transducer means responsive to motional energy imparted by the participant for providing an output indicative of said motional energy;

logic means responsive to the output of said transducer means for providing a logical output pulse which is indicative of the start of the imparted motional energy, said logical output pulse further having a width proportional to said motional energy;

timing means responsive to external actuation for providing a start signal indicative of the start of a reaction time measurement period, said start signal being caused to occur after a pseudo-random delay after the external actuation, said timing means being further responsive to said logical output pulse for providing a first output representative of the participant's reaction time in response to said start signal and a second output representative of the amount of motional energy imparted by the participant in response to said start signal; and

display means responsive to said timing means first and second outputs for visually displaying the participant's reaction time and the amount of motional energy imparted by the participant.

4,199,988
SAMPLING APPARATUS FOR CHROMATOGRAPHIC INSTRUMENTS

Hubertus Riegger, Uberlingen, Fed. Rep. of Germany, assignor to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,711
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815023
Int. Cl.[2] G01N 1/10
U.S. Cl. 73—422 GC 10 Claims

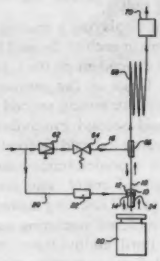
1. Sample feeding apparatus for use with a measuring instrument comprising:

a housing defining a first chamber having an inlet in communication with a source of carrier gas for conveying carrier gas into said first chamber, said housing defining a second chamber having an inlet in communication with a source of purging gas for conveying purging gas into said second chamber,

means for sealing said first chamber and said second chamber one from the other,

means carried by said housing defining a gas conduit including a needle having an opening adjacent one end in communication with said gas conduit, said conduit means being movable between first and second positions relative to said housing and having a gas port providing for communication between said second chamber and said gas conduit for flowing purging gas from said second chamber through said port, said gas conduit and said opening when said conduit means lies in its first position, and

means for biasing said conduit means for movement into said first position, said conduit means being movable into said

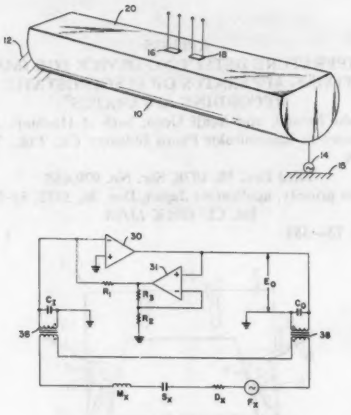


second position against the bias of said biasing means to locate said port in said first chamber for conveying carrier gas from said first chamber through said port, said gas conduit and said opening into the sample vessel.

4,199,989
COLD DAMPING OF MECHANICAL STRUCTURES

Robert L. Forward, Oxnard, and Robert W. Peterson, Sepulveda, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sep. 18, 1978, Ser. No. 943,280
Int. Cl.[2] G01D 11/10
U.S. Cl. 73—430 8 Claims

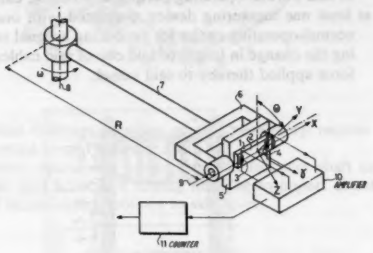


1. In an electromechanical system including a mechanical member which is subject to vibrational movement, first and second electromechanical transducers mounted on said member, said first electromechanical transducer being capable of providing an electrical charge having a rate of change proportional to the velocity of said mechanical member, said second electromechanical transducer being capable of imparting a motion to said member in response to an electrical voltage applied thereto, circuit means being connected between said first and second transducers said circuit means including a current-to-voltage transducer, said current-to-voltage transducer comprising a differential-input operational amplifier operating in the current input mode and having a low noise-temperature feedback circuit.

4,199,990
ELASTIC SURFACE WAVE ACCELEROMETER

Michel Valdois; Patrick Levesque, and Pierre Hartemann, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 27, 1978, Ser. No. 919,550
Claims priority, application France, Jul. 1, 1977, 77 20372
Int. Cl.[2] G01P 15/08
U.S. Cl. 73—517 AV 10 Claims

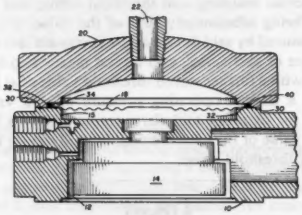


1. An elastic surface wave accelerometer comprising a base undergoing the acceleration to be measured, a wafer of elastic piezoelectric material, oscillator means for causing elastic surface waves to propagate at the surface of said wafer and detector means for detecting the angular modulation of the a.c. oscillation voltage produced by said oscillator means; the first major face of said wafer carrying at least one electromechanical transducer connected to said oscillator means; the second major face of said wafer being cemented to said base along its whole area.

4,199,991
ISOLATION DIAPHRAGM ASSEMBLY FOR PRESSURE TRANSDUCERS AND METHOD OF MANUFACTURE

Roy K. Kodama, Thousand Oaks, Calif., assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 8, 1978, Ser. No. 903,853
Int. Cl.[2] G01L 7/08
U.S. Cl. 73—706 6 Claims



1. In a pressure transducer of the type comprising: a hollow transducer housing, a pressure transmitting liquid within said housing, a flexible isolation element secured to said housing with one side thereof in pressure transmitting relation to said pressure transmitting liquid and a cover secured to said housing for admitting a test fluid to the other side of said flexible isolation element, the improvement comprising:

a peripheral flange on said flexible isolation element;

a first annular sealing surface on said housing, said sealing surface having at least one annular groove formed therein and being sized to accommodate at least said peripheral flange;

a plurality of spaced tack welds securing said peripheral flange to said annular sealing surface;

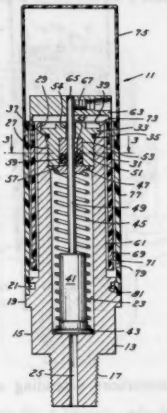
means formed in said peripheral flange subsequent to said plurality of spaced tack welds for extending into said annular groove to provide a second annular sealing surface on said peripheral flange between said spaced tack welds and said annular groove, thereby to prevent radial movement of said flexible isolation diaphragm and to minimize leakage of said pressure transmitting fluid; and

seal means located in said cover for contacting said peripheral flange on said second annular sealing surface.

4,199,992
PRESSURE INDICATOR

J. Edgar Myles, Bloomfield, Mich., assignor to J. E. Myles, Inc., Troy, Mich.

Continuation of Ser. No. 945,762, Sep. 25, 1978, abandoned. This application Apr. 18, 1979, Ser. No. 31,270
Int. Cl.[2] G01L 7/16
U.S. Cl. 73—744 13 Claims



1. In a pressure indicator having a body with an attachment shank with a pressure fluid passage, a cylinder bore at one end communicating with said passage and having a threaded open end, an end plug having a bore and a counterbore snugly threaded into said open end, a piston nested in said cylinder bore having a piston rod axially extending through said cylinder bore and projecting through and outwardly of said plug, and a compression spring interposed at its ends between said plug and piston yieldably biasing said piston towards said one end of said cylinder bore, said piston being variably movably longitudinally against said spring on application of pressure to said pressure fluid passage, the improvement comprising:

a bushing nested within said plug bore axially and guidably receiving said piston rod;

a cylindrical slide seal of plastic material within said plug bore and projected into and depending from said bushing in sealing engagement with said piston rod; and

an O-ring seal in said plug bore sealingly interposed between said plug and slide seal.

4,199,993
PRESSURE INDICATOR

Edward W. Graczyk, Madison Heights, Mich., assignor to J. E. Myles, Inc., Troy, Mich.

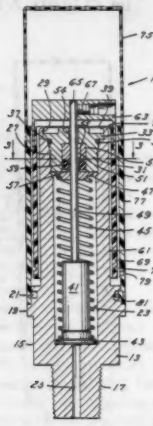
Continuation of Ser. No. 955,734, Oct. 30, 1978. This application Apr. 23, 1979, Ser. No. 32,059
Int. Cl.[2] G01L 7/16
U.S. Cl. 73—744 9 Claims

1. In a pressure indicator having a body with an attachment shank with a pressure fluid passage, a cylinder bore at one end communicating with said passage and having a threaded open end, an end plug having a bore and a counterbore snugly

threaded into said open end, a piston nested in said cylinder bore having a piston rod axially extending through said cylinder bore and projecting through and outwardly of said plug, and a compression spring interposed at its ends between said plug and piston yieldably retaining said piston at one end of said cylinder bore, said piston being variably movable longitudinally against said spring on application of pressure to said shank passage, the improvement comprising;

a bushing nested within said plug bore having a bore axially and guidably receiving said piston rod and counterbore;

an annular tapered boss of reduced diameter on and depending from said bushing with its outer surface inclined downwardly and inwardly at an acute angle with respect to the axis of said bushing;



said bushing counterbore extending axially through said boss;

a cylindrical slide seal of plastic material within said plug bore and snugly producted into said boss and bushing counterbore and depending from said boss in sealing engagement with said piston rod within said bushing and boss, and below said boss; and

an O-ring in said plug bore sealingly interposed between said plug and slide seal and in operative compressive engagement with the angular surface of said boss;

said angular boss surface providing for increased operative sealing and pressure engagement of said O-ring between said plug and seal.

4,199,994

SYSTEM FOR MONITORING THE MECHANICAL PARAMETERS OF A PRESSURE VESSEL

Burkhard Beine, Krefeld Forstwald; Hermann Ostendorf, Krefeld, and Gunter Schmidt, Tonisvorst, all of Fed. Rep. of Germany, assignors to Siempelkamp Giesserei GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,607

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1977, 2728651

Int. Cl.[2] **G01B** *5/30*

U.S. Cl. 73—785 **14 Claims**

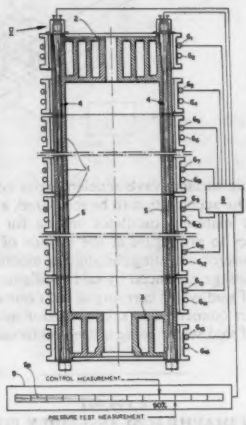
1. A system for monitoring the structural integrity of a pressure vessel, comprising, in combination:

a generally cylindrical pressure vessel assembled from a plurality of cast elements and formed with angularly spaced axially extending passages;

an array of angularly spaced axially extending axial-stressing cables passing through said passages and axially stressed against said vessel, said axial-stressing cables including a number of normal-operation axial stressing cables adapted to take up these axial stresses of said vessel during normal operation and safety axial-stressing cables provided in addition to the normal-operating axial-stressing cables;

an array of peripheral stressing cables bearing upon the periphery of said vessel and spaced therealong, said peripheral-stressing cables extending circumferentially about said vessel and including normal-operating peripheral-stressing cables adapted to take up all of the radial forces developed by said vessel during normal operation thereof, and safety peripheralstressing cables provided in addition to said normal-operating peripheral-stressing cables;

at least one measuring device associated with one of said normal-operating cables for producing a signal representing the change in length of said one of said cables and the force applied thereby to said vessel;



circuit means connected to said device and adapted to store a threshold value representing a fraction of the measurement produced by said device at the maximum safe operating pressure of said vessel; and

means connected to said circuit means for signaling an alarm upon the actual measured value of the signal produced by said device reaching said threshold value, said threshold value being substantially 90% of the value which would be measured by said device at the maximum safe operating pressure of said vessel, said circuit means also being provided with a further stored threshold value of at least 10% below a normal operating pressure of said vessel, said means for signaling said alarm responding to a fall in the actual value of the measurement by said device below the further threshold value.

4,199,995

RECIPROCATING MOTION GENERATING APPARATUS

Saburo Murakami, Sakai, Japan, assignor to Wataru Shimokawa, Japan

Filed Dec. 16, 1977, Ser. No. 861,379

Int. Cl. F16h *25/16*

U.S. Cl. 74—54 **9 Claims**

1. Reciprocating motion generating apparatus in combination with a sewing machine comprising:

(a) a drive shaft;

(b) a cylindrical cam having a constant diameter;

(c) a bore in said cam for receiving said shaft, said bore being oblique with respect to the axis of said cam so that the eccentricity of said cam varies gradually along said shaft;

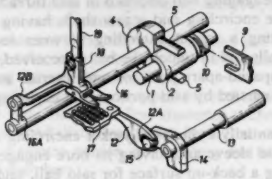
(d) means for changing the relative axial position of said cam with respect to said shaft;

(e) a follower member;

(f) a pair of contact members carried by said follower mem-

ber to engage opposite sides of said cam thereby imparting reciprocating motion to said follower member when said drive shaft rotates;

(g) a follower shaft parallel with said drive shaft and secured



to said follower member so that oscillatory motion is imparted to said follower shaft;

(h) means operatively connecting said follower shaft to a cloth feed lever of a sewing machine to impart circular and reciprocating motions to said lever.

4,199,996

PRECISE FEEDING TABLE APPARATUS

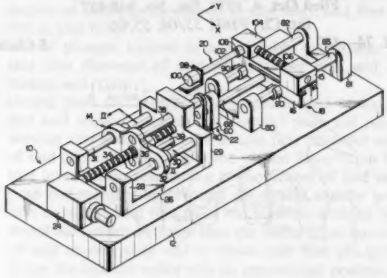
Yoshinaga Moriwaki, Yokohama; Masashi Kamiya, Tama; Katsunobu Ueda, Yokohama; Masaharu Terashima, Yokohama; Tetsuo Aikawa, Yokohama; Tameyasu Tsukada, Tokyo, and Hirosuke Ohshio, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 14, 1977, Ser. No. 860,433

Claims priority, application Japan, Dec. 16, 1976, 51/150355

Int. Cl.[2] F16H *27/02, 29/02, 29/20*

U.S. Cl. 74—89.15 **14 Claims**



1. A precise feeding table apparatus which comprises a base; first precise feeding means having precise reciprocating means, said reciprocating means including a driving shaft, first power source, a connecting rod whose free end is provided with a flange and a first conversion mechanism for converting the rotating movements of the driving shaft to a precise reciprocating movement of said connecting rod; an XY-table assembly including a Y-table reciprocating in the same direction as the reciprocating means of the first precise feeding means and an X-table mounted on the Y-table to be reciprocated in a direction perpendicular to that in which the Y-table is reciprocated; coupling means for transmitting the reciprocating movement of the reciprocating means of the first precise feeding means to the Y-table of the XY-table assembly, the coupling means including a first fluid bearing disposed around the flange of the connecting rod to support said rod in contactless relationship, an inner housing for receiving the first fluid bearing, an outer housing for receiving the inner housing to move it in the axial direction of the connecting rod, a second fluid bearing for supporting the inner housing in contactless relationship with the outer housing, and an output shaft connected at one end to the movable inner housing and at the other end to the Y-table, thereby transmitting a force for effecting the precise feeding of the Y-table by the first precise feeding means; and second precise feeding means including a second power source provided with a driving shaft and mounted on the base, second conversion means set on the Y-table to convert the rotating movement of a rotary shaft into a minute rotating movement and a rotatable output shaft, both ends of which are connected to the second conversion mechanism and X-table respectively, thereby supplying the X-table with a force for its precise feeding.

4,199,997

FRONT DERAILLEUR

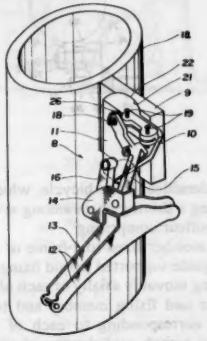
Mitsuhide Isobe, Toyonaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 21, 1978, Ser. No. 879,885

Claims priority, application Japan, Feb. 21, 1977, 52-18334

Int. Cl.[2] B62M *9/12, 25/00;* **F16H** *11/08*

U.S. Cl. 74—217 B **13 Claims**



1. A front derailleur for a bicycle, which is used for selectively switching a driving chain among at least two sprockets, comprising:

a fitting member fixed non-movably to a bicycle frame extending upwardly in the vicinity of said sprockets, said fitting member having a fitting face extending radially outwardly of said frame toward said sprockets and vertically of said bicycle;

a shifting mechanism connected with said fitting member, said shifting mechanism comprising a support connected to said fitting member, a chain guide guiding said driving chain and having a guide plate extending forwardly and backwardly of said frame, a movable member carrying said chain guide, and connecting members mounting said movable member to said support so that said movable member is movable axially of each of said sprockets and toward at least two positions corresponding to each of said sprockets, said support having a connecting face opposite to and mating with said fitting face of the fitting member,

a first adjusting means for adjusting said chain guide in its position with respect to each of said sprockets in a radial direction thereof, said adjusting means being formed by one of said fitting face and connecting face being made to have a vertical length larger than the length of the adjustment range of the chain guide, thereby enabling said connecting face to be movable upwardly and downwardly relative to said fitting face,

a second adjusting means for adjusting an angle of the longitudinal line of said chain guide with respect to the common axis of said sprockets, said second adjusting means being formed by said fitting face and connecting face having complimentary mating surfaces formed in a circular arc located on the frame side of said sprockets around

a center line extending upwardly and downwardly of said fitting face, and

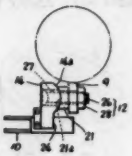
a fixing means for fixing said support of the shifting mechanism at a desirable position on said fitting face of the fitting member, said fixing means being operable to release said support from being fixed and allowing the relative positioning between said support and said fitting member to be changed after said support is released.

4,199,998

FRONT DERAILLEUR

Mitsuhide Isobe, Toyonaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 22, 1978, Ser. No. 880,130
Int. Cl.[2] B62M *9/12, 25/00*; F16H *11/08*
U.S. Cl. 74—217 B **18 Claims**



1. A front derailleur for a bicycle, which is used for selectively switching a driving chain among at least two sprockets, said front derailleur comprising:

(a) a fixing member fixed to a frame of the bicycle;

(b) a chain guide supported to said fixing member, said chain guide being movably axially of each of said sprockets with respect to said fixing member and toward at least two positions corresponding to each of said sprockets and serving to switch said driving chain from one of said sprockets to another;

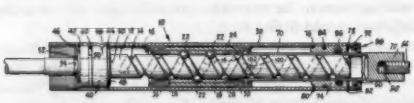
(c) an adjusting means for adjusting the position of said chain guide with respect to said fixing member, said adjusting means comprising an extension having a first adjusting face connected to one of said chain guide and fixing member and a receiving surface having a second adjusting face connected to the other of said chain guide and fixing member, said second adjusting face engaging with the first adjusting face of said extension, said first and second adjusting faces being movable relative to one another to adjust the fitting angle of said chain guide relative to the outer periphery of said sprocket, said front derailleur further comprising sustaining means for maintaining the adjusted position of said chain guide with respect to said fixing member, so that said chain guide may be adjusted in its position with respect to said fixing member by means of said adjusting means and kept in the adjusted position by means of said sustaining means.

4,199,999

BALL-TYPE MECHANICAL TRANSMISSION

Joseph R. Metz, Ridgefield, Conn., assignor to Norco, Inc., Ridgefield, Conn.

Filed Jul. 28, 1978, Ser. No. 929,195
Int. Cl.[2] F16H *1/18*
U.S. Cl. 74—424.8 NA **24 Claims**



1. A light-load mechanical actuator device for applying reciprocating forces to a machine part, comprising in combination:

(a) an elongate screw shaft having a helical thread characterized by a rounded bottom trough,

(b) a shaft-engaging ball disposed in said thread,

(c) a sleeve encircling said screw shaft, having an opening constituting a socket extending between its inner and outer walls and in which the ball is received, said sleeve having spaced-apart portions and internal annular slide bearings carried by said portions and engaging the screw shaft,

(d) a substantially cylindrical jacket encircling and closely fitting said sleeve and having its bore engaged with and providing a back-up surface for said ball, said jacket extending beyond the ends of the sleeve,

(e) locking rings disposed in the bore of the jacket, one of said rings engaging one end of the sleeve,

(f) a tubular connector member in which the shaft is received, said connector member having a shouldered extremity disposed within said jacket and engaged by the other locking ring,

(g) anti-friction slide bearings carried exteriorly at the ends of said jacket, and

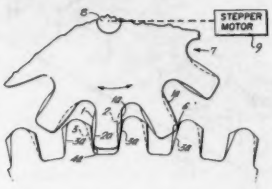
(h) a tubular housing surrounding said jacket and having its bore engaged by said anti-friction bearings, said anti-friction bearings enabling sliding movement of the sleeve and jacket to occur within the housing as the screw shaft is rotatably driven.

4,200,000

GEAR TRAIN

Werner Flüehmann, Hessigkofen, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Switzerland

Filed Oct. 4, 1978, Ser. No. 948,457
Int. Cl.[2] F16H *55/04, 55/06*
U.S. Cl. 74—437 **5 Claims**



1. A gear train in which rotation in either sense may be transmitted from a driving gear to a driven gear and transmission of rotation in either sense from the driven gear to the driving gear is blocked, wherein each gear comprises a pair of discs fastened together on their faces, each disc of each pair having asymetric teeth on its periphery and being a reflection about a diametral line of the other disc of the pair, the juxtaposed teeth of each assembled pair appearing symmetric when the assembled pair is viewed in plan.

4,200,001

VALVE TRAVEL MECHANISM

Oswald O. Kytta, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 812,548, Jul. 5, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,466
Int. Cl.[2] G05G *9/00*; F15B *9/10*
U.S. Cl. 74—478 **5 Claims**

1. In a servomotor having a control valve retained in a bore of a hub attached to a movable wall, said control valve being operated through movement of a first plunger by a linear input force directly and continually transmitted from a brake pedal through an input member, said operated control valve allow-

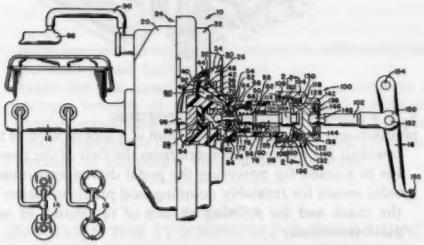
ing a pressure differential to be created across the movable wall and thereafter supply an output member with an operational force, the improvement wherein said input member includes:

a housing having a first end attached to said hub and a second end extending through the servomotor, said housing having a bore therethrough;

a fulcrum member attached to said second end of the housing, said fulcrum member having an annular projection extending rearwardly therefrom;

a cap member having a stepped bore therethrough, said stepped bore having a first diameter section separated from a second diameter section by a first shoulder, said second diameter section surrounding and engaging said fulcrum member;

a first push rod member located in said bore of the housing and connected to said first plunger, said first push rod member having an annular groove located thereon;



lever means having a first end located in said radial groove in said first push rod member and a second end radially extending toward and engaging said second diameter section of said cap member to axially align said first push rod in said bore;

a second plunger located in and slidably engageable with said first diameter of said cap member and said lever means; and

a second push rod member connected to said brake pedal and said second plunger, said second push rod member moving said second plunger in said first diameter section of said cap member in response to said linear input force, said lever means responding to movement of said second push rod member by pivoting about said annular projection to supply said first push rod member with an operational movement different than the linear input movement of said second push rod to move said first plunger and bring the control valve into an operational position, said output member remaining substantially stationary until said control valve is in the operational position.

4,200,002

PARKING BRAKE MECHANISM FOR MOTOR VEHICLE EQUIPPED WITH POWER TRANSMISSION WITH TORQUE CONVERTER

Kotei Takahashi, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

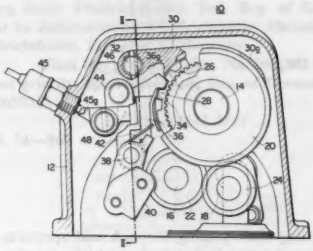
Filed Jul. 27, 1977, Ser. No. 819,451

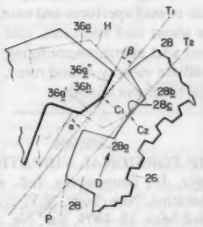
Claims priority, application Japan, Jul. 28, 1976, 51-99607[U]

Int. Cl.[2] G01P *3/18*

U.S. Cl. 74—530 **1 Claim**

1. A parking brake mechanism in a motor vehicle transmission having a transmission output shaft, comprising a brake gear coaxially mounted on said output shaft for rotation therewith, said brake gear including at the periphery thereof a plurality of external teeth, a brake pawl mounted for rotation about an axis parallel to the axis of said output shaft and carrying thereon a tooth engageable with a gap formed between any corresponding two of said teeth when biased to lean toward said brake gear, and a parking cam for urging said brake pawl to lean toward said brake gear when biased in a given direction, wherein said tooth of said brake pawl includes thereon first, second, third and fourth surfaces at a portion thereof which substantially enters said gap of said brake gear when said tooth is engaged with said gap for locking said brake gear, said first and second surfaces being inclined with respect to each other and bounded by an intersectional line parallel with the axis of said output shaft and having at opposite positions with respect to said intersectional line respective edges away from which said third and fourth surfaces extend, the inclination angle of each of said first and second surfaces with respect





to a tangent line passing through an imaginary point at which said intersectional line is in contact with a circular path swept out by the outer peripheral surface of said teeth being greater than zero degrees, the respective inclination angles of said third and fourth surfaces with respect to said first and second surfaces being selected so that ridges by which said first and third surfaces, and said second and fourth surfaces are bounded are substantially received in said gap when said tooth enters said gap to such a degree as to achieve locking of said brake gear.

4,200,003

MAGNETIC VISCOUS DAMPER

Donald L. Miller, Horseheads, N.Y., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Continuation of Ser. No. 671,921, Mar. 29, 1976, abandoned.

This application Jun. 19, 1978, Ser. No. 917,136

Int. Cl.[2] F16F *15/10, 15/22*

U.S. Cl. 74—574 **1 Claim**

1. An unsealed magnetic viscous damper for reducing the unwanted oscillations of a rotating shaft comprising:

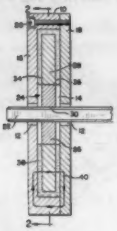
a magnetic permeable housing enclosing a cylindrically shaped cavity having an axis of symmetry, said housing having shaft clearance apertures passing through the walls of said housing concentric with said axis of symmetry, said clearance apertures having a diameter larger than the diameter of the rotating shaft;

a permanent magnet rotor disposed in said cavity and rotatable therein, said rotor having an annular configuration with an external diameter smaller than the diameter of said

cylindrical cavity and an internal diameter larger than the diameter of said apertures;

a magnetic fluid disposed in said cavity filling the space between said rotor and the internal walls of said cavity; said magnetic fluid being a viscous connection between said rotor and said housing; and

a non-magnetic hub disposed in said cavity and fixedly connected to said rotor, said hub having means for receiving



the rotating shaft passing through said apertures of the housing and rotating said rotor with the rotation of the shaft, said non-magnetic hub having a diameter larger than the diameter of said apertures and causing a magnetic field free region about said apertures, said magnetic field free region about said apertures confining said magnetic fluid to the immediate vicinity of said rotor, thereby eliminating the need for mechanical seals.

4,200,004

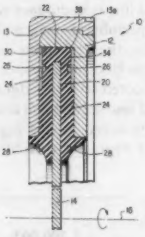
ZERO SLIP TORSIONAL VIBRATION DAMPER

Robert C. Bremer, Jr., Brownsburg, Ind., assignor to Wallace Murray Corporation, New York, N.Y.

Filed Mar. 15, 1979, Ser. No. 20,859

Int. Cl.[2] F16F *15/10*

U.S. Cl. 74—574 **7 Claims**



1. A torsional vibration damper of the type including an inertia ring coupled to an annular hub by means of an annular elastomer member, the inertia ring having an annular cavity which receives the radially outermost portion of the hub, the hub extending into an annular slot within the elastomer member, the elastomer member also being positioned in the annular cavity and being sandwiched by the inertia ring and the hub, the improvement comprising, the radially innermost portion of the elastomer in the annular cavity being under compression, the radially outermost portion of the elastomer in the annular cavity being uncompressed, a film of viscous liquid on at least one side of the radially outermost portion of the elastomer; whereby the radially outermost portion of elastomer in the annular cavity with its associated film of viscous liquid functions as a viscous damper, and whereby the radially innermost, compressed elastomer in the annular cavity functions as a torsional spring.

4,200,005

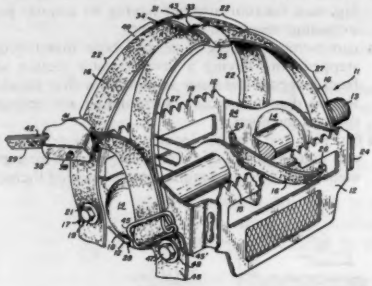
PEDAL HAVING AN IMPROVED FOOT-RETAINING STRAP MEANS

Siegfried H. Mohr, 3311 Benton St., Santa Clara, Calif. 95051

Filed Aug. 28, 1978, Ser. No. 937,049

Int. Cl.[2] G05G *1/14*

U.S. Cl. 74—594.6 **12 Claims**



1. In a pedal for a pedal driven apparatus:

platform means to receive the bottom of a foot or shoe of the operator for transmitting work from the foot of the operator to a crank for powering the pedal driven apparatus;

spindle means for rotatably coupling said platform means to the crank and for defining an axis of revolution of said platform means;

strap means for extending over at least a portion of the foot of the operator for holding the foot of the operator to the platform means, said strap means being of adjustable length and pliable for conforming to the upper contour of the foot or shoe of the operator to provide uniform distribution of the reactive force on the shoe or foot of the operator;

elevating means for holding said strap means in spaced apart relation above said platform means to provide an opening therebetween so as to facilitate entry therein of the foot of the operator, said elevating means being formed and arranged for attachment to and extending above said platform means; and

said platform means, said elevating means, and said strap means, when assembled to receive the foot of the operator, being disposed such that their combined moments are such as to rotate the foot receiving portion of said platform means into a generally horizontal plane facing upward with the open portions of said strap means disposed over the foot receiving portion of said platform means to facilitate entry of the foot of the operator into said open portions of said strap means.

4,200,006

GEAR-CHANGE TRANSMISSION WITH DIFFERENTIAL

Friedrich Ehrlinger, Friedrichshafen, and Anton Ott, Tettnang, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Apr. 24, 1978, Ser. No. 898,811

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718652

Int. Cl.[2] F16H *37/06, 1/44*

U.S. Cl. 74—681 **10 Claims**

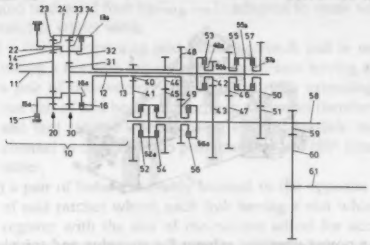
1. A gear train transmission having a plurality of speeds, said transmission comprising:

a differential having an input shaft and a pair of output shafts to which input torque is distributable, said differential comprising at least two mutually coupled planetary gear sets and having at least one coupling shaft;

each of the differential output shafts having at least one gear train connecting to a further shaft for driving said further

shaft at a speed determined by the gear teeth of the gears of the respective trains whereby at least some of the transmission speeds are determined by the selective operation of respective gear trains;

respective switching clutches associated with each of said gear trains and selectively actuatable to render said gear



trains operable to connect the respective differential output shaft to said further shaft; and

a brake for said coupling shaft actuatable exclusively to reverse rotation of said further shaft, said differential further comprising a switching clutch for said coupling shaft actuatable to block differential action and effect joint rotation of said output shafts in the same sense.

4,200,007

APPARATUS FOR SYNCHRONIZING THE DRIVING AND DRIVEN MEMBERS DURING GEAR SHIFT OPERATIONS

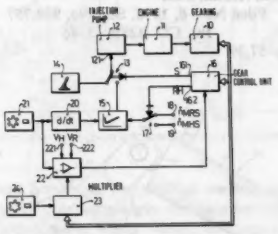
Helmut Espenschied; Uwe Kiencke, both of Ludwigsburg, and Alfred Schulz, Oberriexingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 9, 1978, Ser. No. 932,171

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742033

Int. Cl.² B60K *41/08*

U.S. Cl. 74—859 **8 Claims**



1. In drive apparatus having gearing (10) having a plurality of gear ratios, an engine (11) for driving said gearing, energy supply means (12) connected to said engine for supplying energy thereto in accordance with an energy control signal, externally operable energy control signal furnishing means (14) for furnishing said energy control signal to said energy supply means, and gear control means (16) for furnishing a shift initiate signal for initiating a gear shift under predetermined operating conditions, a system for synchronizing said engine to said gearing during a so-initiated gear shift from a present gear to a next subsequent gear, comprising regulator means (15) for furnishing an energy control signal adapted to change the speed of said engine from a present speed corresponding to said present gear to a desired speed corresponding to said next subsequent gear;

and switch means (13) connected between said energy control signal furnishing means, said regulator means and said energy supply means, for disconnecting said energy supply means from said energy control signal furnishing means and connecting said energy supply means to said regulator means during said so-initiated gear shift.

4,200,008

HYDRAULIC ACTUATING SYSTEM FOR A PAIR OF CONCURRENTLY OPERATING FRICTION DEVICES FOR THE SELECTION OF SPEEDS OF A LOAD-SHIFTABLE TRANSMISSION

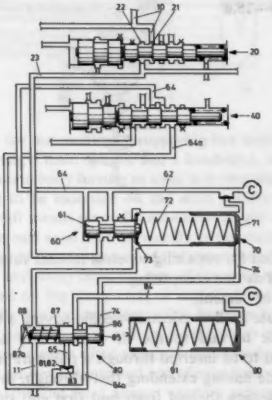
Hansjorg Dach, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 28, 1977, Ser. No. 865,302

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659353

Int. Cl.² F16H *3/44*

U.S. Cl. 74—869 **4 Claims**



1. In a hydraulic control system for a multispeed transmission shiftable under load and having two friction devices hydraulically actuatable concurrently in a predetermined speed condition of the transmission through a 2–3 shift valve, a first of said friction devices remaining actuated in a neighboring speed condition and being connected to a first control valve having a valve slider which acts against a spring in a first phase of pressure build-up in said first friction device and acted upon by a direct abutment formed by a piston of a first damper connected to the first friction device, a second control valve connected to a second of said friction devices and to a second damper having a piston acting upon a restoring spring with a fixed seat, and wherein the hydraulic lines to both said friction devices are connected in the concurrently actuated state there of, the improvement wherein:

in said predetermined speed condition of the transmission with concurrent actuation of said first and second friction devices, a first hydraulic line feeding the first friction device is connected by the 2–3 shift valve to a direct passage and to a throttle-containing passage communicating via the second control valve selectively with a second hydraulic line feeding the second friction device; and

the second control valve has a slider to one end surface of which is applied the pressure of the first friction device while a restoring spring bears in the opposite direction upon said slider of said second control valve so that at a pressure in the first friction device below a threshold value said second control valve connects said direct passage to said second hydraulic line and blocks the throttle-containing passage and upon the pressure in said first

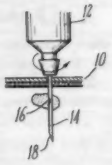
friction drive attaining said threshold value, said second control valve blocking said direct passage and connecting said throttle-containing passage to said second hydraulic line.

4,200,009

DEVICE FOR REPAIRING TUBELESS TUBULAR TIRES FOR BICYCLES

Jean Duttlinger, Soissons, France, assignor to Wolber, Soissons, France

Filed Apr. 19, 1978, Ser. No. 897,774
Claims priority, application France, May 13, 1977, 77 14680
Int. Cl.[2] B60C *25/16*
U.S. Cl. 81—15.6 **4 Claims**



1. A device for repairing tubeless tubular tires and tubeless covers, said device comprising:

a source of cement;

an elongate hollow injection needle having a first end connectable to said source of cement and a second end adapted to be inserted through a puncture hole in a tire;

said needle having extending therethrough, throughout the entire length thereof from said first end thereof to said second end thereof, an internal hollow passageway through which cement from said source may be supplied;

first dispensing means, positioned intermediate said first and second ends of said needle, and adapted to be located within the interior of the tire when said needle is inserted through the puncture in the tire, for dispensing a first quantity of cement from said internal passageway to the exterior of said needle, said first dispensing means comprising a lateral orifice extending through said needle from said internal passageway thereof to the outer side surface thereof, whereby rotation of said needle within the puncture will form said first quantity of cement into an annular patch of cement surrounding the puncture on the inner surface of the tire, whereafter said needle may be partially withdrawn from the puncture to a position whereat said lateral orifice will be blocked and sealed by the puncture edges of the tire; and

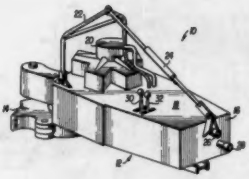
second dispensing means for dispensing a second quantity of cement from said internal passageway when said needle is in said partially withdrawn position, said second dispensing means comprising an end orifice extending through said needle from said internal passageway thereof to the extremity of said second end thereof, whereby said second quantity of cement is formed as a drop of cement on said second end of said needle at a position aligned substantially centrally of the puncture, and whereafter said needle may be completely withdrawn from the puncture, thereby depositing said drop of cement centrally of the puncture and causing said drop of cement to join with the center of said annular patch of cement to form a relatively wide deposit of cement centered on and sealing the puncture.

4,200,010

POWER-OPERATED DRILL PIPE SPINNER AND PIPE TONGS

Burton L. Hewitt, 704 Oxford Dr., Laurel, Miss. 39440

Filed Aug. 7, 1978, Ser. No. 931,620
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.16 **15 Claims**



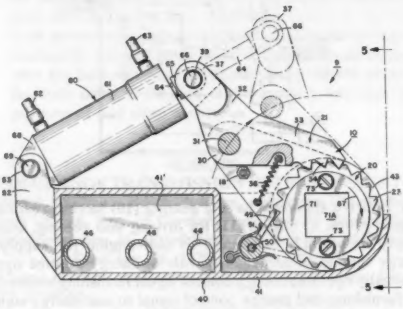
1. In a power-operated spinner for engaging and spinning a section of drill pipe into threaded engagement with a drill string to a given torque and including drill pipe tongs, means mounting said tongs to said spinner, said tongs including a lever arm and pivotably related jaws connected thereto for engaging said drill pipe, said jaws being shiftable from an open position for initially receiving said drill pipe to a latched position in which said jaws are interlocked with each other in non-gripping relation about said pipe and thence to a gripping position in which said jaws grippingly engage said pipe, the improvement comprising means operatively connected between said spinner and tongs for automatically shifting said jaws from said latched position to said gripping position when said spinner has spun said drill pipe section into threaded engagement with said drill string to substantially said given torque, thereby said jaws grip said drill pipe section so that rotation of the lever arm of said tongs is enabled for setting a final make-up torque of said drill pipe section with said drill string.

4,200,011

HIGH POWER WRENCHING TOOL

Claude H. Wilmeth, Montgomery, Tex., assignor to N-S-W Corporation, Austin, Tex.

Filed Nov. 8, 1978, Ser. No. 958,757
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—57.39 **7 Claims**



1. A high-power wrench tool comprising in combination,

(a) a high-torque ratchet wrench having two parallel side plates, each plate having at one end thereof a bore; a ratchet wheel and a cooperating pawl being operatively disposed between said plates; said wheel having a slot for receiving therein a mating drive socket; a plurality of angularly spaced teeth on the outer peripheral wall of said wheel; a cylindrical boss laterally extending from each

side of said wheel, said bosses being rotatably supported in said bores of said plates; said pawl having a base, a pin traversely extending between said plates for pivotably mounting said pawl on said plates; a pawl arm extending laterally and upwardly relative to said base, a pawl foot extending laterally and downwardly relative to said base, and said pawl foot having teeth adapted to mesh with the ratchet wheel teeth;

(b) a frame supporting said ratchet wrench and in use providing a reaction force thereto; said frame having a beam, a pair of transversely spaced outer rings extending from one end of said beam and forming a channel therebetween, and said ratchet wrench being adapted to slide into said channel in either of two positions that are 180° from each other;

(c) a pair of hubs removably secured to the opposite bosses of said ratchet wheel; each hub having a slot which is in register with the slot of the ratchet wheel for accepting said drive socket therethrough; said hubs being rotatably mounted on said outer rings which extend from said beam; and

(d) a fluid-operated actuator having a double-acting piston, a ram extending from said piston, said ram being detachably coupled to said pawl arm, and said cylinder being pivotably coupled to the other end of said beam.

4,200,012

METHOD AND APPARATUS FOR TRUING RAILROAD WHEELS

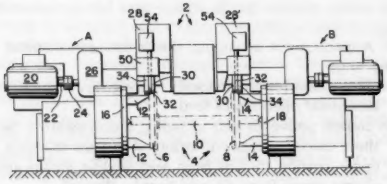
Helmut Wittkopp, and Bernhard Kunze, both of Erkelenz, Fed. Rep. of Germany, assignors to Firma W. Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 889,914

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2713997

Int. Cl.² B23B *5/28*

U.S. Cl. 82—1 C **5 Claims**



1. A method for truing the profiled surface zones of the wheels of a set of railroad wheels, said profiled surface zones including a tread and a wheel flange, said wheel set being mounted for rotation about an axis of rotation, comprising the steps of: mounting at least two cutting tools on a common carriage means so that at least one of said two cutting tools is movable on said common carriage means relative to the other of said two cutting tools, and moving said common carriage means relative to said profiled surface zones in a direction normal to and in a direction parallel to said axis of rotation into positions to effect cutting of said profiled surface zones, precutting only a portion of the profiled surface zones with one of said tools on said common carriage, moving said one tool on said common carriage out of cutting engagement with the respective precut surface zone portion, and finishing the truing by finish cutting with the other tool across the entire surface of said profiled surface zones, whereby the copying motion of said common carriage carrying both tools remains uninterrupted during the precuttng and the finish cutting so that both cutting operations are performed in a single work cycle.

4,200,013

AUTOMATIC SUPPLY DEVICE FOR BAR STOCKS FOR LATHE

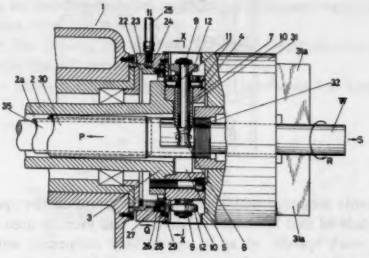
Shoji Momoi, and Yukio Mitsuguchi, both of Niwa, Japan, assignors to Kabushiki Kaisha Yamazaki Tekkosho, Niwa, Japan

Filed May 5, 1978, Ser. No. 905,522

Claims priority, application Japan, May 18, 1977, 52-57417

Int. Cl.² B23B *13/00*

U.S. Cl. 82—2.5 **3 Claims**



1. A device for automatically supplying bar stock in a machine tool having a main spindle and a headstock, said device comprising: a main body having an axial hole therethrough and being adapted to be mounted on the main spindle; a pair of pinch roller shaft means pivotally mounted on said main body extending from said axial hole outwardly of the main body and pivotally mounted for movement of the inner ends of the shaft means toward and away from the axis of the main body; pinch rollers mounted on the inner ends of said shaft means with a concave profile for engagement with bar stock extending through the axial hole; drive rollers on the outer ends of said shaft means; and a press plate axially movable relative to said main body for movement into and out of engagement with said drive rollers and being fixed against rotation around said axis, and means for moving said press plate axially; whereby when said press plate is moved into engagement with said drive rollers and said main spindle is rotated, said main body is rotated for rolling said drive rollers along said press plate for rotating said pinch rollers to feed a bar stock pinched by said pinch rollers.

4,200,014

WORKPIECE CHANGING MECHANISMS FOR LATHES

Erich Dormehl, Giessen, Fed. Rep. of Germany, assignor to Heyligenstaedt & Comp., Werkzeugmaschinenfabrik GmbH, Giessen, Fed. Rep. of Germany

Filed Jul. 5, 1978, Ser. No. 922,173

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734228

Int. Cl.² B23B *13/00*

U.S. Cl. 82—2.7 **6 Claims**

1. In a numerically controlled lathe having a work spindle, a turnings guard, and a tool-carrying turret in which a tool centering recess is provided and which is arranged to be moved in a direction essentially parallel to the axis of said spindle, a workpiece changing mechanism comprising:

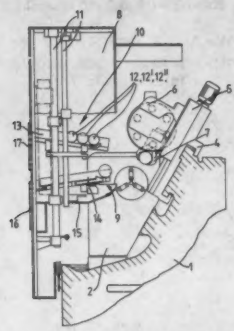
first workpiece transfer means for conveying workpieces-to-be-machined to an area defined within the vicinity of said work spindle;

second workpiece transfer means for conveying machined workpieces away from said vicinity area of said work spindle; and

workpiece gripping means mounted within said centering recess of said tool-carrying turret for transferring said workpieces-to-be-machined from said first transfer means to a work fixture of said lathe and for transferring said

machined workpieces from said work fixture of said lathe to said second transfer means,

said first and second workpiece transfer means being mov-



ably mounted within said turnings guard on the operating side of said lathe and relative to said vicinity area of said work spindle so as to operatively cooperate with said workpiece gripping means in a cyclical manner.

4,200,015

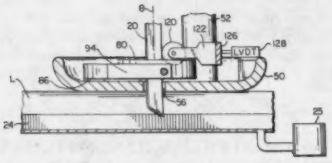
CLOSED LOOP METHOD AND APPARATUS FOR CUTTING SHEET MATERIAL

Heinz J. Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Division of Ser. No. 790,149, Apr. 22, 1977, Pat. No. 4,133,235. This application May 25, 1978, Ser. No. 909,511

Int. Cl.[2] B26D *5/00*; D06H *7/00*

U.S. Cl. 83—22 **12 Claims**



1. A method of cutting limp sheet material with a controlled cutting machine having a cantilever-mounted, reciprocated cutting blade with a sharp knife edge comprising:

generating fundamental machine command signals for translating the cutting blade and the limp sheet material relative to one another along a predetermined cutting path with the cutting blade in cutting engagement with the sheet material;

sensing lateral loads applied to the cutting blade by the limp sheet material engaging the sides of the blade with a force sensor as the blade and material translate relative to one another in cutting engagement;

generating additional signals representative of the sensed lateral loads from the material; and

controlling the orientation of the cutting blade about an axis perpendicular to the sheet material and relative to the predetermined cutting path with the additional signals as the blade and material translate relative to one another along the path to cause the sensed lateral loads applied by the material to be reduced toward zero.

4,200,016

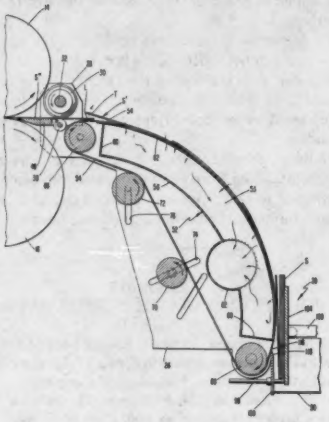
APPARATUS FOR FORMING A HORIZONTAL STACK OF VERTICALLY ORIENTED SHEETS

Richard W. Helmig, Owings Mills, Md., and Clinton L. Berwick, East Hampton, Mass., assignors to Rotographic Machinery, Owings Mills, Md.

Filed Jun. 13, 1978, Ser. No. 915,247

Int. Cl.[2] B65H *29/18, 29/24, 29/66, 31/06*

U.S. Cl. 83—88 **13 Claims**



5. Apparatus for arranging sheets into a horizontal stack comprising:

feeding means for continuously feeding sheets in a generally horizontal direction of feed;

an endless conveyor belt including a downwardly inclined sheet transport segment arranged to receive sheets at an upper portion thereof from said feeding means and discharge sheets from a lower portion thereof;

drive means for driving said conveyor belt at a speed slower than the speed at which sheets are fed from said feeding means so that a leading edge of a succeeding sheet overtakes a trailing edge of an immediately preceding sheet carried by said conveyor belt;

suction means for producing a vacuum at the surface of said inclined transport segment of said conveyor belt for drawing a leading portion of the preceding sheet suddenly thereagainst such that the trailing edge of said preceding sheet flips upwardly to permit the leading edge of the succeeding sheet to underlap such trailing edge; and

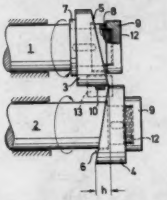
sheet stacking means disposed adjacent said lower portion of said inclined belt segment, said sheet stacking means comprising sheet supporting means for receiving lapped sheets falling from said belt in substantially vertical orientation such that a horizontal stack of sheets forms on said supporting means;

said sheet supporting means including retaining means engageable with an initial sheet of the stack to support the latter and to be displaced thereby as the stack builds-up.

4,200,017
SECTIONING APPARATUS FOR ELONGATE MATERIAL

Hubert Fein, Olpe, Fed. Rep. of Germany, assignor to Firm Josef Frohling, Olpe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 696,224, Jun. 15, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,266
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1976, 2600402
Int. Cl.[2] B23D 25/12; B26D 1/56
U.S. Cl. 83—333 5 Claims



1. Sectioning apparatus for cutting traveling elongate material of a given width into a plurality of separate pieces, comprising:

means for cutting elongate material into a plurality of separate pieces including a pair of cutting cylinders, means for mounting said cylinders for rotation about their respective axes of symmetry with said axes substantially parallel and with the cylinder peripheries in close proximity to each other and with said cylinders axially offset from each other so that an end face of one cylinder is disposed adjacent an end face of the other cylinder, a cutting edge formed at the periphery of each said adjacent cylinder end face, each said end face being tapered so that its cutting edge reciprocates to execute a cutting stroke axially of said cylinder during rotation thereof, said cutting stroke having a predetermined axial length greater than the width of said elongate material, said adjacent end faces being equally but oppositely tapered, the taper angle of each said end face in relation to the cylinder diameter determining said axial length of said cutting stroke, and means for rotating said cylinders synchronously in opposite directions; and

guide means for guiding elongate material having a width narrower than the axial length of said cutting stroke into the nip of said cylinders substantially at right-angles to said axes and at an axial position substantially midlength of said cutting stroke of each cutting edge, said guide means preventing the feeding of elongate material having a width greater than the axial length of said cutting stroke.

4,200,018
CIRCUIT BOARD WIRE TRIMMING APPARATUS

Mitsunao Sekiwa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

Filed Nov. 29, 1977, Ser. No. 855,901
Claims priority, application Japan, Nov. 29, 1976, 51-143866; Nov. 29, 1976, 51-160387[U]; Aug. 24, 1977, 52-113861[U]; Aug. 24, 1977, 52-113862[U]
Int. Cl.[2] B23D 33/02; B26D 7/06
U.S. Cl. 83—425 22 Claims

1. A circuit board wire trimming apparatus for trimming wire members protruding outwards from a circuit board, which comprises, in combination:

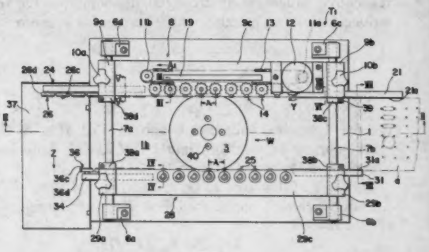
a framework;

first and second elongated support means for supporting the circuit board and for transporting the circuit board in one direction parallel to the lengthwise direction of said first and second elongated support means, said first elongated support means having a plurality of driving members carried thereby in a row in equally spaced relation to each other in a direction parallel to the direction of transportation of the circuit board, each of said driving members being constituted by a pair of coaxially aligned roll elements supported by said first elongated support means for rotation in a plane parallel to the plane of the circuit board being transported, said roll elements of each pair being placed one above the other and cooperating with each other to define a groove therebetween, said second elongated support means having a guide means defined therein lengthwise of said second elongated support means for movable engagement of one of the opposed side edges of said circuit board therewith;

means for holding said first and second elongated supporting means over said framework;

means for driving the driving members simultaneously to rotate the roll elements of all pairs;

means provided for each of the roll elements for biasing



either one of said roll elements of each pair towards the other of said roll elements of each pair to hold the other of the opposite side edges of the circuit board therebetween, thereby enabling the transmission of the rotational force of the roll elements of any pair to the circuit board to move the latter in said one direction with said opposed edges of the circuit boards respectively movably engaged in said guide means and said grooves defined between the pairs of the roll elements;

a blade member rotatably supported on the framework for rotation about an axis thereof in a plane parallel to the plane of the circuit board, said blade member being positioned to trim the excess length from the wire members while said circuit board is transported with the opposed side edges respectively guided by the first and second elongated support means; and

means for driving said blade member.

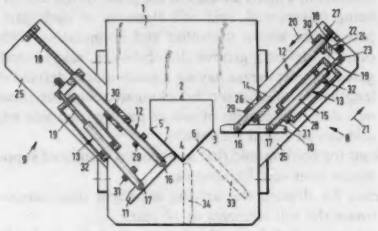
4,200,019
TABLE STOP FOR A CUTTING MACHINE

Harald Fazis, Lorrach-Hauingen, Fed. Rep. of Germany, assignor to Ludwig Boschert GmbH & Co. KG, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,104
Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723432
Int. Cl.[2] B26D 7/16
U.S. Cl. 83—467 R 11 Claims

1. A table stop for a machine for cutting sheet material, more particularly a notching machine comprising, a stop rail which is movable along the blade of a cutting tool whereby this movement of the stop rail is limited by means of two adjustable gauges, the stop rail further being rotatable about a pivot axis extending vertically with respect to the machine table whereby the angular adjustment of the stop rail is limited by means of two further adjustable gauges, a respective double acting pres-

sure cylinder for each of (1) adjustment of the movement of the stop rail and (2) the angular adjustment of the stop rail, the



respective gauges being arranged adjustably on the relatively movable working member of the respective pressure cylinder.

4,200,020

DRAW CUTTER

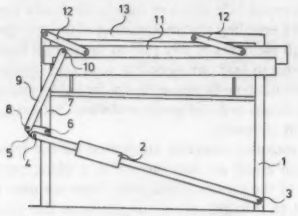
Hans J. Dürselen, München Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, München Gladbach, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,813

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977; 2724805

Int. Cl.² B26D *5/12*

U.S. Cl. 83—643 **2 Claims**



1. In a hydraulically operated cutting machine having a machine frame; a bell crank lever articulated to the machine frame at a fixed center of rotation; a hydraulic power cylinder articulated to the bell crank lever at a first displaceable center of rotation spaced from the fixed center of rotation and further articulated to the machine frame at an additional center of rotation spaced from the bell crank lever; a knife bar movably supported on the frame and having a raised position and a lower, cutting position; and an actuating rod articulated to the knife bar and to the bell crank lever at a second displaceable center of rotation spaced from said fixed center of rotation, whereby an actuation of the hydraulic power cylinder effects motion of the knife bar from its raised position into its cutting position while said first and second displaceable centers of rotation travel, respectively, along a first and a second circular path as said bell crank lever pivots about said fixed center of rotation; the improvement wherein said centers of rotation being so arranged with respect to one another that in said lower cutting position of said knife bar said second displaceable center of rotation has at least reached its lowermost position along said second circular path; and further wherein said bell crank lever has such an orientation with respect to said additional center of rotation that the distance between said first displaceable center of rotation and said additional center of rotation is greater in the raised position of said knife bar than in its cutting position.

4,200,021

ELECTRONIC MUSICAL INSTRUMENTS WHICH FORM MUSICAL TONES BY REPEATEDLY GENERATING MUSICAL TONE WAVEFORM ELEMENTS

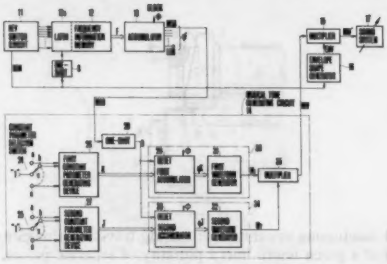
Masanobu Chibana, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Dec. 7, 1978, Ser. No. 967,398

Claims priority, application Japan, Dec. 9, 1977, 52-147184

Int. Cl.² G10H *1/02, 5/02*

U.S. Cl. 84—1.22 **8 Claims**



1. An electronic musical instrument comprising a plurality of key switches which determine a tone pitch of a musical tone generated by said musical instrument;

a periodic trigger pulse generating circuit which generates a trigger pulse having a period corresponding to a designated one of said key switches;

a constant parameter generator which generates a predetermined constant parameter;

first and second waveform generators responsive to said periodic trigger pulse and to the output of said constant parameter generator for producing outputs having different waveforms;

a multiplying circuit to multiply with each other the outputs of said first and second waveform generators for producing a musical tone waveform element;

said first waveform generator generating an oscillatory waveform;

said second waveform generator generating another waveform which builds up from a predetermined reference level to a higher level and then decreases toward said reference level;

said musical tone waveform element having an envelope which increases from zero to a predetermined value and then decreases to zero; and

means for repeatedly generating said musical tone waveform element at a period corresponding to the period of said trigger pulse so as to form a musical tone wave thereby repeatedly generating said musical tone waveform element to form said musical tone.

4,200,022

ENVELOPE CONTROL CAUSING DAMPER EFFECT ON PERCUSSIVE VOICES OF ELECTRONIC MUSICAL INSTRUMENT

Joseph C. Carley, Sycamore, and Anthony C. Ippolito, DeKalb, both of Ill., assignors to The Wurlitzer Company, DeKalb, Ill.

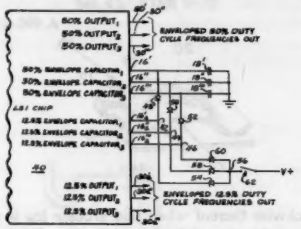
Filed Jun. 20, 1978, Ser. No. 917,295

Int. Cl.² G10H *1/02, 5/00*

U.S. Cl. 84—1.26 **7 Claims**

1. Envelope control for an electronic musical instrument comprising a plurality of controlled gates for respectively conducting a like plurality of electric signals corresponding to respective musical tones, a like plurality of electrical energy storing means respectively connected to said gates respectively to control the conductivity thereof according to the level of electrical energy respectively stored in each of said storing means, a like plurality of first means for respectively supplying

electrical energy to said storing means and a like plurality of first discharging means for respectively discharging electrical energy from said storing means, a like plurality of second discharging means for respectively discharging electrical energy from said storing means, a like plurality of means respec-

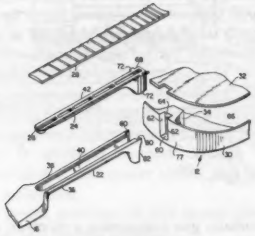


tively interconnecting said electrical energy storing means and said second discharging means and each including gate means, and means for rendering said gate means selectively conductive or non-conductive whereby to render said second discharging means effective or ineffective in respectively discharging said electrical energy storing means.

4,200,023
STRINGED MUSICAL INSTRUMENT NECK AND BODY STRUCTURE

Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032

Filed May 15, 1978, Ser. No. 905,271
Int. Cl.² G10D *3/00, 1/08*
U.S. Cl. 84—293 **4 Claims**

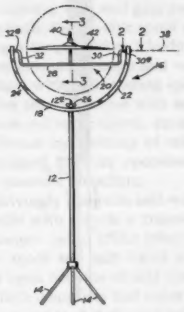


1. A stringed musical instrument having a body with upper and lower ends, and a neck extending upwardly from said upper end of said body, said neck being an assembly of parts including a main part having a forward surface and a curved rear surface and also having a forwardly opening groove in said forward surface extending longitudinally of said main part, an elongated stiffener received in said groove of said main part and fixed to said main part along substantially their entire common length, and a fingerboard overlying said forward surface of said main part and said stiffener, characterized by said body having at its upper end an outside surface and a block defining an upwardly opening recess in said outside surface, said recess having two generally vertical side surfaces and a bottom surface extending between said side surfaces, said stiffener having a rearwardly enlarged lower end portion including a tongue received in said body recess and which tongue has two generally parallel side surfaces engaged with said side surfaces of said body recess, said lower end portion of said stiffener also including two flanges at the upper end of said tongue each of which flanges extend laterally outwardly from an associated one of said side surfaces of said tongue and has a downwardly facing bearing surface which engages said outside surface of said body adjacent the corresponding edge of said body recess, said tongue having a lower end surface extending between its side walls and spaced upwardly from said bottom surface of said body recess, fastener means cooperating with said body and with said stiffener for holding said downwardly facing bearing surfaces of said stiffener flanges in tight engagement with said outside surface of said body, said main part of said neck having a rearwardly extending portion at its lower end which is recessed to receive said stiffener flanges and which has an end surface flush with said downwardly facing bearing surfaces of said flanges and at least approximately engaged with said outside surface of said body to provide a neat joint line between said neck and said body and to conceal said stiffener from view, a tension rod extending longitudinally through said stiffener, means at the upper end of said stiffener limiting movement of the upper end of said tension rod toward its lower end, said tension rod at its lower end extending downwardly beyond the lower end of said tongue and through and beyond said block, and a nut threaded onto said lower end of said tension rod and workable against the lower surface of said block to tension said tension rod and to thereby axially compress and bend said stiffener and to assist said fastener in holding said stiffener flanges in tight engagement with said outside surface of said body.

4,200,024
APPARATUS FOR MOUNTING A PERCUSSION INSTRUMENT

James B. Watson, 1440 Wilson St., Eugene, Oreg. 97402

Filed Oct. 2, 1978, Ser. No. 948,098
Int. Cl.² G10D *13/06;* **G10G** *5/00*
U.S. Cl. 84—421 **5 Claims**



1. Apparatus for mounting a cymbal comprising:
a standard; and
rotatable means mounted on said standard for supporting the cymbal and permitting it to revolve, after impact, about an axis lying generally parallel to a plane defined by the marginal periphery of the cymbal.

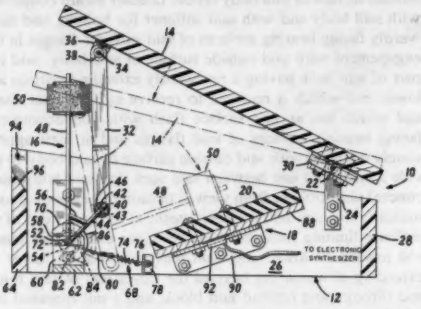
4,200,025
FOOT-OPERATED CONTROL DEVICE

George T. Currier, 2601 Gorniak Dr., Parlin, N.J. 08859

Continuation-in-part of Ser. No. 825,091, Aug. 16, 1977, abandoned. This application Mar. 17, 1978, Ser. No. 887,658
Int. Cl.² G01D *13/02*
U.S. Cl. 84—422 R **22 Claims**

1. A portable foot-operated control device for musical instruments, comprising a base; a sounding member attached to the base; a pedal having an upper surface and a lower surface, the pedal being pivotable about a first pivot axis located on the base; a beater pivotable about a second pivot axis located on the base; and linkage means connected between the pedal and the beater for pivoting the beater towards the sounding mem-

ber in response to pivoting of the pedal, the beater pivoting directly below the pedal and passing in close proximity to the



lower surface of the pedal during the pivoting of the beater and the pedal.

4,200,026

BRUSH TYPE DRUMSTICK

Andrew W. Phreaner, 13 Emerson Ct., Amherst, Mass. 01002

Filed Jul. 7, 1978, Ser. No. 922,643
Int. Cl.[2] G10D *13/00*
U.S. Cl. 84—422 S **11 Claims**

1. A drumstick comprising, a handle having two ends; and a bundle of relatively stiff polypropylene filaments, each of said filaments being substantially straight and substantially equal in length and having a substantially oval shaped transverse cross-section and extending outwardly from and attached to one end of said handle;

said handle and said bundle of filaments having a common longitudinal axis.

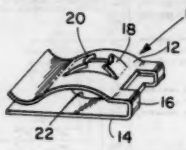
4,200,027

FASTENING DEVICE

Donald N. Oehlke, Troy, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 22, 1977, Ser. No. 826,296
Int. Cl.[2] F16B *37/00, 39/00*
U.S. Cl. 85—36 **2 Claims**

1. An improved one-piece self-retaining sheet metal fastener for substantially fixed mounting to a panel having an aperture therethrough and for receiving and retaining a rotationally tightened externally threaded fastener, said sheet metal fastener of a generally cross sectionally "U" shape comprising a first leg and a second leg joined by a bight portion, one of said legs comprising an arcuate leg having a plurality of tongues formed therefrom, said tongues inclined at an angle generally equal to the pitch of said externally threaded fastener to be received, said tongues adapted to lockingly engage said externally threaded fastener and to resist rotation clockwise and



counterclockwise thereof when said arcuate leg is resiliently deformed by tightening of the externally threaded fastener, the improvement comprising:

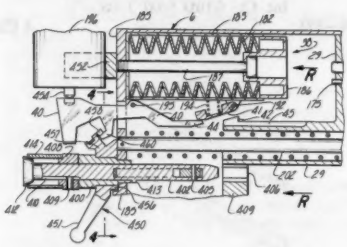
said arcuate leg defining an arc in the non-deformed position thereof, the ratio of the radius of the arc to the chord of the arc being in the range of 1:1.4 to 1:1.8.

4,200,028

MULTI-PURPOSE GUN SAFETY

William R. Bains, Lake Elsinore, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 18, 1978, Ser. No. 934,783
Int. Cl.[2] F41D *11/02*
U.S. Cl. 89—142 **5 Claims**



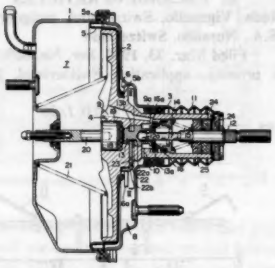
1. In an automatic gun comprising a receiver; a bolt carrier reciprocatable longitudinally in said receiver; a buffer assembly mounted at the rear of the receiver in the path of the bolt carrier for buffering the recoil force generated by the bolt carrier during movement thereof in the recoil direction; a shoulder **(42)** upstanding from the bolt carrier and a spring-urged sear **(41)** carried by the buffer assembly for engaging the shoulder to latch the carrier against movement in the counter-recoil direction; and a trigger swingably mounted at the rear end of the receiver for lifting the sear out of operative alignment with the shoulder, whereby the receiver is then enabled to undergo movement in the counter-recoil direction: the improvement comprising safety stop means for restricting the trigger to an inactive position disengaged from the sear; said safety stop means comprising an arm structure swingably mounted on the receiver for movement between a first active position in the path of the trigger to a second inactive position out of the path of the trigger, and a handle connected to said arm structure for moving same between its first and second positions; a disengageable safety latch movable from a first position restraining the bolt carrier against counter-recoil movement to a second position out of operative alignment with the bolt carrier; and means operatively interconnecting the stop means and latch so that the arm structure is in its active position when the latch is in its carrier-restraining position.

4,200,029

DIAPHRAGM BRAKE BOOSTER

Atushi Ohmi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 5, 1978, Ser. No. 903,129
Claims priority, application Japan, May 6, 1977, 52-57721[U]
Int. Cl.[2] F15B *9/10*
U.S. Cl. 91—369 A 3 Claims



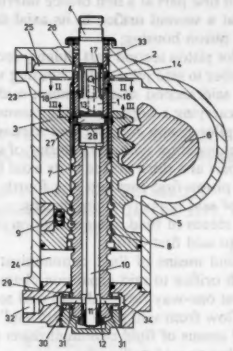
1. A diaphragm brake booster comprising:
a housing;
a diaphragm having a central opening disposed in the said housing and axially movable within said housing;
a power piston having an integral annular flange defining a power piston annular groove for receiving therein the inner periphery of the central opening of said diaphragm, said power piston and diaphragm defining first and second chambers, said first chamber being always connected to a vacuum source and said second chamber being normally connected to said first chamber through fluid passage means provided in said power piston, said annular flange having a radial slot;
air passage means provided in said power piston and connectable to said second chamber;
valve means disposed in said power piston between said air passage means and fluid passage means for preventing fluid communication between said fluid passage means and said second chamber and thereafter for introducing atmospheric pressure into said second chamber;
an operator-operated means for actuating said valve means in response to manual operation;
said valve means including a plunger having a plunger annular groove defining a reduced diameter portion of said plunger, being operatively engaged with said operator-operated means and axially movable relative to said power piston;
a key member including a radially extending portion and an axially extending portion, said radially extending portion disposed in said power piston and engaging said plunger at said reduced diameter portion, the thickness of said radially extending portion being less than the width of said plunger annular groove for preventing excess axial movement of said plunger, said axially extending portion extending through said radial slot for abutting and being supported by said power piston in said power piston annular groove between said power piston and the inner periphery of said diaghragm central opening.

4,200,030

SERVO STEERING GEAR

Dieter Elser, Essingen-Lauterburg, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Aug. 29, 1978, Ser. No. 937,752
Claims priority, application Fed. Rep. of Germany, Sep. 1, 1977, 2739406
Int. Cl.[2] F15B *9/10, 13/10*
U.S. Cl. 91—375 A 6 Claims



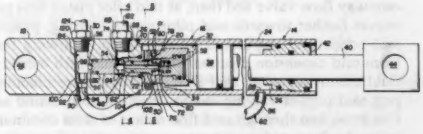
1. In a power steering gear having a housing which comprises a double acting power cylinder having pressure chambers and a piston therebetween carrying a gear rack and a gear sector in said housing meshing with said gear rack and including a rotary steering spindle and a valve spool rotative therewith and also including a torque rod and hollow worm shaft wherein said torque rod extends through said worm shaft and connects said worm shaft with said steering spindle, and still further including a valve sleeve rotative with said worm shaft wherein said valve spool and valve sleeve, upon relative rotation therebetween, effected by twisting of said torque rod, have coacting flow control grooves operational to control flow to and from said pressure chambers;
and wherein a pin drivingly connects said worm shaft with said steering spindle with play in a transverse plane for twisting of said torque rod to effect relative rotation between said valve spool and said valve sleeve for flow control operation upon rotation of said steering spindle;
the improvement which comprises said valve spool having a body secured at one end to said steering spindle and being secured at the other end to said torque rod and said pin passing through said body at said other end of said valve spool and said pin being carried by said worm shaft.

4,200,031

LOCKING CYLINDERS

Nick Skover, Jr., Racine, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Mar. 2, 1978, Ser. No. 882,550
Int. Cl.[2] F15B *11/08, 13/042*
U.S. Cl. 91—420 14 Claims



1. A locking cylinder comprising:

(a) a housing containing a push port, a pull port, and a first axial chamber;
(b) a working piston slidably received in said first axial chamber and dividing said first axial chamber into a rod chamber and an expansion chamber;
(c) a pilot piston housing disposed in said housing and extending into said expansion chamber;
(d) a pilot piston first part slidably received in a second axial chamber in said housing which terminates against said pilot piston housing, said pilot piston first part containing a first bore communicating with the exterior of said pilot piston first part at a first orifice intermediate its axial faces and at a second orifice in its axial face proximal to said pilot piston housing;
(e) a pilot piston second part slidably received in a third axial chamber in said pilot piston housing which communicates with said second axial chamber, said pilot piston second part carrying a poppet valving means seatable in a seat in said pilot piston housing and containing a second bore communicating with the exterior of said pilot piston second part at a third orifice in its axial face proximal to said pilot piston first part and at a fourth orifice on the other side of said poppet valving means;
(f) first means of fluid communication connecting said push port to said first orifice;
(g) second means of fluid communication connecting said fourth orifice to said expansion chamber;
(h) a first one-way flow valve in said second means permitting flow from said push port to said expansion chamber;
(i) third means of fluid communication connecting said rod chamber to said pull port;
(j) fourth means of fluid communication connecting said pull port to the axial face of said pilot piston first part distal to said pilot piston housing;
(k) fifth means of fluid communication connecting said expansion chamber to a differential pressure chamber defined by an inner surface of said pilot piston housing, the outer surface of said pilot piston second part, and the seating side of said poppet valving means;
(l) sixth means for biasing said poppet valving means towards its seated position;
(m) a second one-way valve located in said second bore;
(n) a pin located in said first and second bores between said second one-way valve and said pilot piston first part, said pin being of a length sufficient to unseat said second one-way flow valve when said pilot piston first part and said pilot piston second part are in contact; and
(o) seventh means for biasing said second one-way flow valve towards its seated position, thereby biasing said pilot piston first part and said pilot piston second part towards a slightly spaced position,

whereby

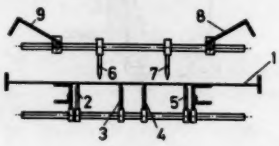
(p) when high pressure fluid is directed to said push port, it travels through said first means of fluid communication, said first and second bores, and the second means of fluid communication to said expansion chamber, while fluid exiting said rod chamber flows through said third means of fluid communication back to said pull port;
(q) when high pressure fluid is directed to said pull port, it travels through said third means of fluid communication to said rod chamber and simultaneously through said fourth means of fluid communication to said first axial chamber, where it acts against the axial face of said pilot piston first part distal to said pilot piston housing, causing said pilot piston first part to move towards said pilot piston housing, first causing said pin to unseat said second one-way flow valve and then, as said pilot piston first part moves further towards said pilot piston housing, pushing said poppet valving means off its seat and allowing flow from said expansion chamber through said fifth means of fluid communication, said differential pressure chamber, past said poppet valving means, through said second and first bore, and through said first means of fluid communication back to said push port;
(r) when an induced pressure develops in said expansion chamber, the pressurized fluid is trapped in said differential pressure chamber, and it is not allowed to exhaust to said push port until the induced pressure overcomes the biasing pressure developed by said sixth means or until a combination of the induced pressure and the pilot pressure coming in through said pull port overcomes the biasing pressure; and
(s) no retraction of said working piston can occur unless pilot pressure is applied to said pull port, unseating said second one-way flow valve.

4,200,032

MACHINE FOR ERECTING SHEET MATERIAL PACKAGING ARTICLES

Emilio Roda, Viganello, Switzerland, assignor to Roda Macchine S.A., Noranco, Switzerland

Filed Mar. 23, 1978, Ser. No. 889,212
Claims priority, application Switzerland, May 26, 1977, 6612/77
Int. Cl.[2] B31B *1/26*
U.S. Cl. 93—37 SP **6 Claims**



1. A machine for erecting packaging sheet material such as cardboard into packaging articles having a base and lateral walls and at least one rib comprising at least one glued fold, said machine comprising opposed longitudinally extending first members adapted to move toward and away from each other with said sheet material between them to fold the sheet material to initiate the formation of said at least one rib, second members adapted to fold two lateral edges of the sheet material to form reinforcement of the walls and to fold said edges into V-shape, third members adapted to insert glue in said at least one fold and to close the same to complete the formation of said at least one rib, fourth members adapted to fold by 90° both lateral walls of the article relative to the base of the box about fold lines that are parallel to each other and perpendicular to said at least one rib, a fixed frame which holds the box in its final shape until setting of said glue takes place, and fifth members adapted to insert the finished box into said frame.

4,200,033

BOX BLANK FEED, TRANSFER AND GLUEING CONTROL APPARATUS

Raymond A. Labombarde, 24 Marlow Rd., Nashua, N.H. 03060

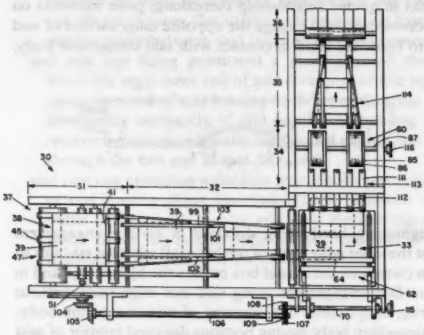
Filed Feb. 16, 1978, Ser. No. 878,284
Int. Cl.[2] B31B *1/06, 1/36*
U.S. Cl. 93—49 R **12 Claims**

1. In a carton folder and gluer of the right angle type having a feed zone, a first folding zone, a transfer zone, a gluing zone and a second fold zone, the combination of:

timed feed means in said feed zone for advancing carton blanks individually and successively from a magazine into said first folding zone;
first endless carrier belt conveyor means in said first folding zone for advancing said blanks individually and successively along a path through said first folding zone;
folding means in said first folding zone for folding each successive blank advancing therethrough along fold lines extending in the direction of said path;
blank transfer menas including a mechanically actuated

pusher bar in said transfer zone for moving each said folded blank in a direction normal to said path into said gluing zone;

second endless carrier belt conveyor means in said gluing zone and in said second folding zone for advancing said blanks individually and successively along a path through said glueing and second folding zones;



gluing means including a pattern glue roll in said gluing zone for gluing each successive blank and second folding means in said second folding zone for folding each glued blank advancing therethrough;

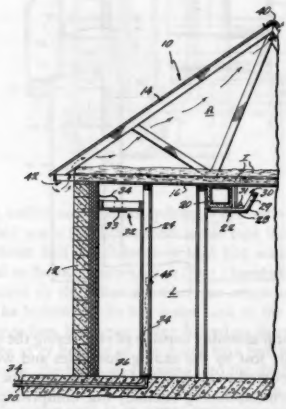
and mechanical drive means including a common drive train, positively connecting said feed means to said pusher bar of said transfer means for synchronizing the right angle transfer of each blank with the feed thereof.

4,200,034

ENERGY CONSERVING CONSTRUCTION

Kenneth N. Listle, and Ernest F. Shreeves, both of Largo, Fla., assignors to Listle/Shreeves, Inc., Largo, Fla.

Filed Apr. 13, 1978, Ser. No. 896,432
Int. Cl.[2] F24F 7/06
U.S. Cl. 98—40 C **13 Claims**



1. A building comprising

a plurality of exterior walls, defining an interior living area,

a roof, defining an attic,

a ceiling disposed between said roof and the interior living area and completely isolating the attic from the interior living area,

air temperature treating means,

ductwork for transferring treated air from said temperature treating means throughout the interior living area,

at least one interior wall, and

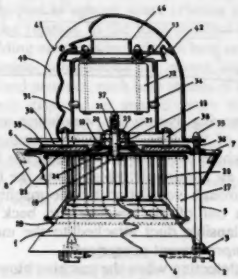
means for mounting ductwork within the interior living area and exterior the attic, adjacent said ceiling, said ductwork mounting areas comprising at least one soffit for mounting ductwork against said ceiling and against said interior wall.

4,200,035

MODULAR VENTILATING ASSEMBLY

Michel H. Zaniewski, Avenue Ferdinand de Lesseps, 34110 Frontignan, France

Filed Jan. 13, 1978, Ser. No. 869,222
Claims priority, application France, Jan. 14, 1977, 77 01647
Int. Cl.[2] F24F 7/06
U.S. Cl. 98—43 R **19 Claims**



1. A ventilating assembly comprising:

a base unit constituted as a static ventilator centered on a base-unit axis and having

a lower portion fittable over a conduit to be vented,

means for fixing said lower portion to sait conduit, and

an upper portion forming a pair of concentric inner and outer seats, spaced axially above said lower portion, and formed at said base-unit axis with an axially throughgoing hole;

a cover releasably securable to said upper portion over said hole thereof;

a turbine unit constituted as a wind-powerable ventilator and having

a mounting portion securable to said upper portion at said inner seat,

a wind-powerable fan rotatable about said turbine axis and having a fan shaft extending upwardly therealong and through said hole when said mounting portion is secured to said inner seat, and

means for mounting said fan on said mounting portion for rotation by ambient wind for aspirating gas through said lower portion from said conduit; and

a drive unit having

a mounting portion securable to said outer seat,

a motor having an output,

a coupling engageable between said output and said fan shaft when same is extending upwardly through said hole, whereby said motor can drive said fan, and

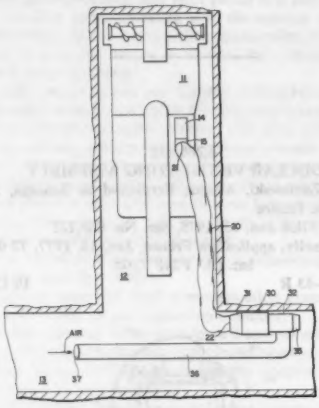
means for releasably connecting said mounting portion of said drive unit to said outer seat.

4,200,036

VENTILATION SYSTEM FOR AUTOMATED MINING MACHINES

Joseph E. Matta, Bel Air, Md., and Fred N. Kissell, Pittsburgh, Pa., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 7, 1978, Ser. No. 958,592
Int. Cl.[2] E21F 1/08
U.S. Cl. 98—50 3 Claims



1. An air moving system for ventilating an underground mine heading of the type in which a mining machine and associated machine blower are located in the heading and in which fresher air is normally sucked into the heading from a tunnel with through ventilation by the machine blower and then is blown out of the heading and back to the tunnel through a collapsible duct attached to the machine blower, wherein the improvement comprises:

a sensor for detecting when the machine blower is not blowing air through the collapsible duct;

a standby blower located in the tunnel and operatively responsive to the sensor for sucking fresher air from the tunnel through the collapsible duct into the heading in a direction opposite to that of the normal flow when the machine blower is not functioning; and

an intake duct with an inlet upstream of the heading, for supplying fresh air to said standby blower; and a damper means for controlling movement of air, said damper means being movable from a first position wherein said damper means directs air downstream of the heading, to a second position wherein said damper means cause fresher air from said intake duct to be blown by said standby blower through the collapsible duct and then into the heading.

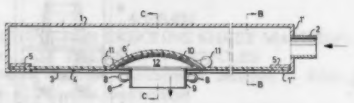
4,200,037

DEVICE FOR TRANSFER OF SUBSTANTIALLY FRESH AIR FROM A STATIONARY PLACE TO A MOVING RECEIVING PLACE

Sven E. Svensson, Box 465, 801 06 Gävle, Sweden

Filed Jan. 10, 1978, Ser. No. 868,449
Claims priority, application Sweden, Jan. 25, 1977, 7700757
Int. Cl.[2] F24F 7/04, 13/02
U.S. Cl. 98—40 R 2 Claims

1. A device for transfer of substantially fresh air from a stationary place to a moving, air receiving, place comprising: a stationarily arranged elongated box with walls and with air inlet means connected thereto and one of its elongate walls, in its longitudinal direction, having a longitudinal slot; a tightening band within said box, extending along and covering said slot and having its ends firmly secured to said box; a connection body provided with air passage means including outlet means for fresh air supply to the receiving place projecting through, guided in and displaceable along said slot and having a slide path surface solely slidably engaged with the outer surface of said tightening band which faces said slot; said connection body air passage means includes side inlet openings in and a cavity within said connection body and said outlet means is an outlet pipe from said cavity projecting through said slot in guided relationship therealong; press members on said connection body engage the opposite inner surface of said band to hold said band in contact with said connection body;



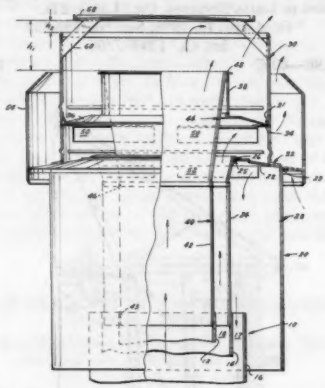
said tightening band being disposed in surface engagement against the inner edge parts of the box wall adjacent said slot so that an over-pressure in said box presses the tightening band in tight surface engagement along said slot edge parts without hindering longitudinal displacement of said connection body; said connection body having portions disposed interior of said box provided with guide means slidably engaging the inside surface of the slot edge parts under said band; and backing support rollers on said connection box bearing against the outside surface of the slot edge parts of said box.

4,200,038

CHIMNEY TOP ASSEMBLY

Clifton Briner, Huntington, and George Alexander, Fort Wayne, both of Ind., assignors to American Standard Inc., New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,542
Int. Cl.[2] F23L 17/02
U.S. Cl. 98—84 1 Claim



1. A chimney top assembly capable of recovering the energy which is normally lost by the exiting flue gases and which is adapted to be mounted to the exit end of a chimney flue or the exit end of a thermosiphoning chimney flue comprising:

a divergent nozzle having a first outwardly tapered section and an open outer end, said tapered section diverging at an angle of up to about 15°, and having a second section adapted to be coupled to the exit end of a chimney flue;

a housing having an open outer end which is spaced from and surrounds said divergent nozzle section with its open outer end and extending above the open outer end of said nozzle section;

said housng and said divergent nozzle having means for mounting said chimney assembly to said chimney flue;

a rain cap mounted above the open outer end of said housing with the perimeter of said rain cap being spaced from the open outer end of said housing so as to define an annular space between said rain cap and said housing;

a baffle surrounding said divergent nozzle section positioned between the open outer end of said housing and the exit end of said chimney flue to block off ambient air from said annular space between said rain cap and said housing;

said rain cap being positioned a predetermined distance above the open outer end of said divergent nozzle and the open outer end of said housing to direct exiting flue gases divergently outwardly of said nozzle and housing while recovering energy normally lost by said exiting flue gases through the exit end of said flue; and

said rain cap extending a distance above said open outer rim of said housing of not less than 1/10 the diameter of the outlet of the nozzle section and from the rain cap a distance above the nozzle outlet of not less than 1/3 the diameter of the outlet of the nozzle section.

4,200,039

COFFEE MACHINE

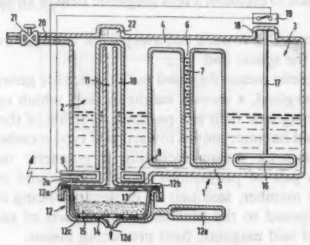
Siegfried Anderl, Amstetten, Fed. Rep. of Germany, assignor to Wurttembergische Metallwarenfabrik, Geislingen, Fed. Rep. of Germany

Filed Oct. 11, 1978, Ser. No. 950,425

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1977, 2745959

Int. Cl.² A23F *1/00*

U.S. Cl. 99—302 R **10 Claims**



1. A coffee machine comprising a pressure-tight boiler having a hot water tank and a cold water tank having a volume at least about half the volume of said hot water tank, a heater located in the hot water tank, a filter chamber, a discharge line connected to the filter chamber, an ascending tube running from the bottom of the hot water tank to the inlet end of said discharge line, hot water being forced up through said ascending tube after heating of the water by a buildup of pressure in said boiler, the hot water passing into the discharge line and to the filter chamber, said cold water tank communicating with said hot water tank in an upper region of said boiler and also through a connection near the bottom thereof so that as the hot water is forced out of the hot water tank, cold water will flow into the hot water tank from the cold water tank through said connection, the connection controlling the quantity of cold water supplied to thereby controlling the maximum temperature of the hot water and substantially preventing heat from penetrating into said cold water through convection.

4,200,040

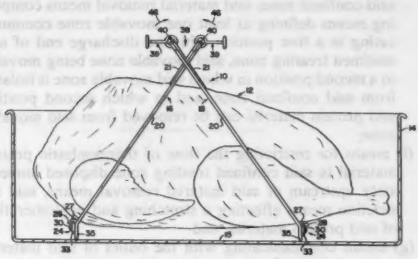
POSITIONING, HOLDING AND LIFTING DEVICE

Brian P. MacRae, 925 Beach Rd., Apt. 408, Sarasota, Fla. 33581

Filed Mar. 22, 1979, Ser. No. 23,018

Int. Cl.² A47J *37/04*

U.S. Cl. 99—426 **11 Claims**



1. A positioning device of the type primarily designed for orienting, lifting and positioning fowl and roast type food products during cooking, said positioning device comprising: holding means including at least two holding elements disposed at least in part in spaced apart relation to one another and in supporting relation to the food product being cooked, each of said holding elements including a base means including movably adjustable components for direct support engagement with the food product, each base means of said respective holding elements disposed in spaced apart relation to one another, whereby the food product is supported by and balanced between said base means, handle means attached to said holding means in a substantially oppositely disposed relation to said base means, for transporting of the food product to and from a cooking vessel.

4,200,041

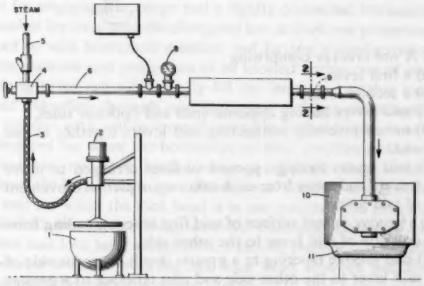
PROTEIN TEXTURIZATION BY STEAM INJECTION

William M. Hildebolt, Mickleton; Murray T. Hundt, Maple Shade, and Robert E. Small, Voorhees, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Division of Ser. No. 645,556, Dec. 31, 1975, Pat. No. 4,038,432. This application May 9, 1977, Ser. No. 794,813

Int. Cl.² A23J *1/00*

U.S. Cl. 99—483 **5 Claims**



1. Apparatus for producing texturized protein material comprising:

(a) means for mixing a source of protein and water to form a slurry;

(b) means for advancing said slurry to an injection zone;

(c) means for injecting a heated gas flow into said slurry in said injection zone;

(d) means defining a confined treating zone communicating

with said injection zone, whereby said gas flow propels said slurry into and through said confined treating zone;

(e) material removal means positioned at the discharge end of said confined treating zone for gently and intermittently isolating and removing discrete quantities of thermoplastic protein material from said confined zone and for simultaneously maintaining a predetermined back pressure in said confined zone, said material removal means comprising means defining at least one movable zone communicating in a first position with the discharge end of said confined treating zone, said movable zone being movable to a second position in which said movable zone is isolated from said confined zone, and in which second position said protein material can be removed from said movable zone;

(f) means for restricting the flow of thermoplastic protein material in said confined treating zone disposed immediately upstream of said material removal means, said restriction means effecting a stretching and agglomeration of said protein material; and

(g) means communicating with the outlet of said material removal means for recovering said protein material in a collection zone.

4,200,042

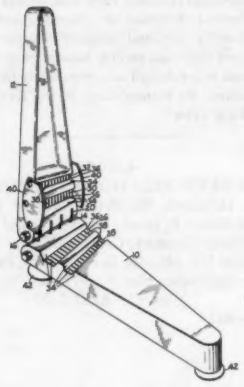
NUT CRACKER

Julian W. Scholz, 3139 NE. 48th Ave., Portland, Oreg. 97213

Filed Oct. 20, 1978, Ser. No. 953,261

Int. Cl.[2] A23N *5/00*

U.S. Cl. 99—582 **4 Claims**



1. A nut cracker comprising

(a) a first lever,

(b) a second lever,

(c) said levers having opposite ends and opposite sides,

(d) means pivotally connecting said levers together at one end,

(e) said levers having opposed surfaces arranged to move toward and away from each other upon pivotal movement of said levers,

(f) a groove in said surface of said first lever extending from one side of said lever to the other side,

(g) said groove tapering to a greater depth from one side of said lever to the other side and also tapering to a greater width from said one side of said lever to the other side,

(h) and a groove in said surface of said second lever extending from one side of said lever to the other side,

(i) the groove in the second lever tapering to a greater depth from one side of said lever to the other side and also tapering to a greater width from said one side of said lever to the other side,

(j) the groove in said second lever being in aligned cooperating arrangement with the groove in said first lever for receiving and cracking nuts when said levers are pivoted together,

(k) said two grooves being widened and deepened in their taper toward the same side of their respective levers whereby nuts of various sizes are arranged to be selectively placed in said grooves and cracked.

4,200,043

PRINTER HAMMER ASSEMBLY

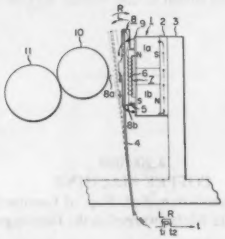
Mineo Nozaki; Osamu Asakura, and Mitsuaki Seki, all of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 720,780, Sep. 7, 1976, abandoned, which is a continuation of Ser. No. 565,225, Apr. 4, 1975, abandoned. This application Mar. 1, 1978, Ser. No. 882,611

Claims priority, application Japan, Apr. 5, 1974, 49-39137; Mar. 28, 1975, 50-37505

Int. Cl.[2] B41J *1/34*

U.S. Cl. 101—93.29 **17 Claims**



1. A printer comprising:

a type member including a plurality of types;

magnetic field producing means spaced from said type member and having one surface for generating a magnetic flux from a first part of said one surface to a second part of said one surface to establish a first magnetic field in an adjacent space;

a hammer movable toward and away from said type member through the space; and

electromagnetic means disposed in the space for generating, when energized, a second magnetic field which opposes the first magnetic field in a particular portion of the space so that said hammer moves toward said type member, said electromagnetic means including a magnetic member having a pair of projections and a coil wound on said magnetic member, said pair of projections being respectively opposed to the first and second parts of said one surface of said magnetic field producing means.

4,200,044

METHOD AND APPARATUS FOR GRAVURE PRINTING THAT INCLUDES LINE WORK

Harry S. Vested, R.R. South, Mount Morris, Ill. 61054

Continuation-in-part of Ser. No. 741,045, Nov. 11, 1976, abandoned. This application Jan. 26, 1978, Ser. No. 872,546

Int. Cl.[2] B41M *1/10, 9/06*; B41N *1/06*

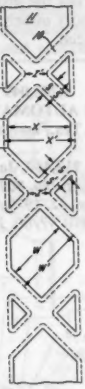
U.S. Cl. 101—170 **36 Claims**

1. A method of preparing a gravure printing surface or surfaces for reproducing both tonal work and line work on a single printed media, said method comprising the steps of

(a) engraving the tonal work image on a printing surface, said image comprising a multiplicity of ink wells separated by a grid of doctor-blade supports with a centerline-to-centerline spacing that provides a high degree of resolution of the tonal work image,

(b) and engraving the line work image on a printing surface, said line work image comprising a multiplicity of ink wells

separated by a grid of doctor-blade supports with a center-line-to-centerline spacing that is substantially greater than the centerline-to-centerline spacing of said doctor-blade supports for said tonal work to provide a smaller number



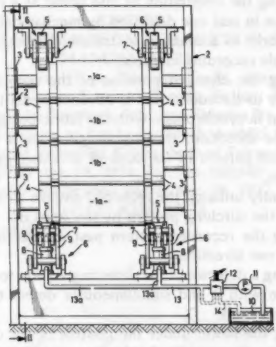
of intersections between said doctor-blade supports and the edges of the line work image than between said doctor-blade supports and the edges of the tonal work image, thereby to improve the continuity and smoothness of the edges of the line work image.

4,200,045

LOADING ARRANGEMENT FOR A CYLINDER STACK

Jorma Toropainen, Simpele, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Continuation of Ser. No. 660,313, Feb. 23, 1976, abandoned.
This application Dec. 6, 1977, Ser. No. 858,021
Claims priority, application Finland, Feb. 27, 1975, 750566
Int. Cl.[2] B41F *13/20*
U.S. Cl. 101—217 **4 Claims**



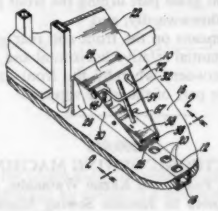
1. An offset printing press, employing a cylinder stack having a plurality of cylinders; said cylinders defined by at least one plate cylinder and at least one blanket cylinder; bearing rings formed, at the axial ends of the cylinders beyond the off-set plate carrying portion thereof, said rings being adapted to transmit the external load to said cylinders, each of said cylinders being further defined by a cylindrical body portion and stub shafts at the respective ends of said cylinders beyond said bearing rings journalled in bearings; wherein: said assembly being further defined by axially short load rollers for automatically transmitting the entire pressure load to the outermost cylinders of said stack, at both said bearing rings, forming thereby a pressure load, said pressure load being of equal magnitude at each end of the respective cylinders; respective central portions of each of said body portions being free of external load applying means in an axial portion corresponding to said offset plate carrying portion; said stub shafts being free of means applying a substantial external stack-compression load.

4,200,046

CHOCK DEVICE FOR A TRANSPORTER

Melvin J. Koliba, Plymouth, and Larry P. Napel, Hamburg, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1978, Ser. No. 965,282
Int. Cl.[2] B60P *7/12*
U.S. Cl. 410—94 **3 Claims**



1. A chock device adapted to be fixedly connected to an elongated bar secured to the floor portion of a transporter for preventing cargo from shifting while the transporter is moving, said elongated bar being formed with a plurality of equally spaced oblong holes along its longitudinal length, said chock device comprising a body portion including an upright member for engaging the cargo and a rigidly connected horizontal member for overlying the elongated bar, at least one projection fixed to said horizontal member and having a configuration which allows said projection to be located within one of said oblong holes and substantially fill the latter, a rotatable lock head extending through said horizontal member and adapted to register with and be located in another of said holes in said elongated bar when the horizontal member overlies said elongated bar, said lock head having an elliptical shape which allows the lock head to pass through said another of said holes in said bar when the lock head is in one position and prevents said lock head from being removed from said elongated bar when said lock head is rotated to a second position, a manually operable lever for rotating said lock head between said first and second positions, a wedge supported by said body portion for raising said lock head towards said horizontal member so when said lock head is in said another of said holes and is located in said second position the lock head serves to maintain said body portion in firm contact with said elongated bar, spring means continuously urging said wedge towards said lock head, and means connected to the wedge for manually releasing said wedge from engagement with the lock head against the bias of the spring means so as to facilitate removal of said chock device from said elongated bar.

4,200,047

TWO PART GRATE FOR STOKERS WITH RECIPROCATING GRATE PLATES

Günter Knorr, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 888,790, Mar. 21, 1978, abandoned. This application Jun. 21, 1978, Ser. No. 917,576
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714600
Int. Cl.[2] F23B 1/22
U.S. Cl. 110—281 10 Claims

1. A two part grate for stokers with reciprocating grate plates, comprising:

a grate support having a front wall surface and grate supporting top surfaces;

a two part grate secured to the grate support and including a rear grate part and a front grate part, said front and rear grate parts supported on the top grate supporting surfaces;

releasable fastening means holding the two part grate downwardly on the grate support, said fastening means engaged with the front grate part urging the front grate part rearwardly and downwardly; and

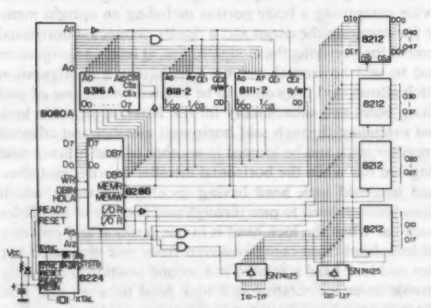
interengaging means on the front and rear grate parts preventing substantial relative horizontal and vertical movement therebetween, whereby the front grate part holds the rear grate part of the grate support.

4,200,048

ELECTRONIC SEWING MACHINE

Hachiro Makabe, Fussa, and Kazuo Watanabe, Hachioji, both of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Apr. 7, 1978, Ser. No. 894,332
Claims priority, application Japan, Apr. 15, 1977, 52-42524
Int. Cl.[2] D05B 3/02
U.S. Cl. 112—158 E 3 Claims



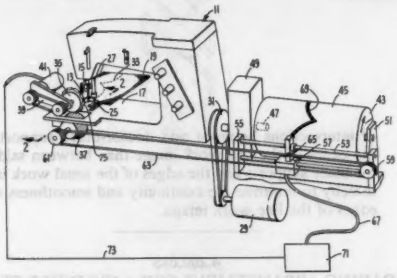
1. A sewing machine with stitch forming and feeding instrumentalities and means for varying the relative positions of the needle and the sewn material to produce the stitches in a pattern, comprising static memory means storing stitch control data for controlling at least one of the stitch forming and feeding instrumentalities; pattern selecting switches selectively operated by the machine operator to select a desired pattern; address means operated by selected ones of the switches to address the static memory means and to make effective the selected groups of the stitch control data; second static memory means for sequentially storing the selected groups of the stitch control data; and function switches selectively operated by the machine operator to operate the second static memory for sequentially reading out the groups of stitch control data from the first static memory means, whereby a set of patterns can be repeatedly produced.

4,200,049

METHOD FOR AUTOMATIC STITCHING

Hubert Blessing, Dallas, Tex., assignor to Levi Strauss & Co., San Francisco, Calif.

Division of Ser. No. 912,450, Jun. 5, 1978, which is a continuation-in-part of Ser. No. 809,305, Jun. 23, 1977. This application Mar. 22, 1979, Ser. No. 22,731
Int. Cl.[2] D05B 97/00, 27/00, 19/00
U.S. Cl. 112—262.3 2 Claims



1. A method of controlling the stitching pattern of a sewing machine, comprising the steps of:

initially manually controlling the direction of fabric being stitched as it is advanced by the machine in one direction under the stitching needle, thereby to manually form the desired stitching pattern,

monitoring the orientation of said fabric as a function of its position in said one direction by mechanically contacting the fabric in a manner to transmit its orientation to a movable recording element,

recording the changed position of the recording element relative to a medium that is advanced past the recording element in synchronism with the fabric being advanced in the one direction, thereby to generate a reproducible recorded pattern of the desired stitching pattern on the medium,

subsequently utilizing the recorded pattern to automatically repeat the stitching pattern by the steps of:

driving the recorded pattern past a detecting station in said one direction,

coupling a detector at the detecting station to the fabric to move with it and simultaneously detect the recorded pattern, and

driving the fabric under the control of the detector in a manner to maintain the detector in alignment with the recorded pattern.

4,200,050

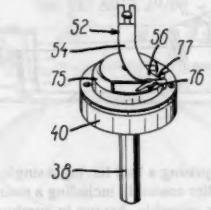
THREAD CUTTING DEVICE FOR LOCKSTITCH SEWING MACHINES

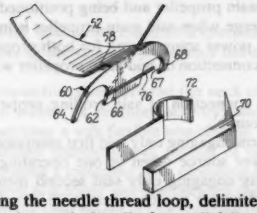
Nereo Bianchi, Pavia, Italy, assignor to Necchi Societa per Azioni, Pavia, Italy

Filed Sep. 5, 1978, Ser. No. 939,879
Claims priority, application Italy, Sep. 27, 1977, 42911 A/77
Int. Cl.[2] D05B 65/00, 53/00
U.S. Cl. 112—292 1 Claim

1. Thread cutting device for lockstitch sewing machines

equipped with vertical axis looptaker and provided with a thread catching member displacing around an axis parallel to the looptaker axis along a path passing over the looptaker, a stationary counter-knife and thread clamping means cooperating with said thread catching member, cam means for imparting, in time relation, this displacement to the said thread catching member wherein said thread catching member is formed by a plate ending with a pointed portion having a notching for





accommodating the needle thread loop, delimited by an edge of this plate and a vertical wall of a small foil at the free end thereof and at right angle to said plate portion, said small foil presenting a bobbin thread catching zone formed between a first and a second tooth and a bobbin and needle thread cutting zone between said second and a third tooth, the surface of this second tooth cooperating with said thread clamping means for clamping the bobbin thread at the end of the cutting operation.

4,200,051

COLLAPSIBLE TUBE AND METHOD OF MANUFACTURE

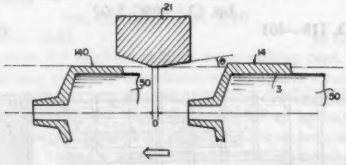
Yoshihiko Nakahara, Hino; Norihiro Tsujii, Atami; Kenichi Nakanishi, Ashigara; Katsuaki Terada, Fujimi; Yuji Sakai, Nakai; Toshitaka Sunahara, Seki, and Shinobu Ito, Tokyo, all of Japan, assignors to Kyodo Insatsu Kabushiki Kaisha and Lion Hamigaki Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 28, 1978, Ser. No. 900,969

Claims priority, application Japan, Apr. 28, 1977, 52-48377

Int. Cl.[2] B21D *51/36*

U.S. Cl. 113—120 D **12 Claims**



1. A method of manufacturing a side seamless collapsible composite tube comprising:

forming a tube blank having a tubular nipple section, a shoulder section joined to said nipple section and a tubular barrel section joined to said shoulder section from a metallic blank material, said sections forming a continuous tube wall;

reducing the thickness of said tubular barrel section wall of said tube blank to a thickness of from about 20 to 70μ, by drawing said tubular barrel section through at least one die ring having a slip-in angle of from about 1° to 4°, a horizontal ironing distance of from about 0.01 to 0.75 mm and a hardness of from about HRC 60 to 80 and the wall thickness reduction ratio of said barrel section being from about 10 to 30%; and

applying a coating of a synthetic resin onto at least a portion of at least one surface of said tubular barrel section wall in a layer from about 50 to 500μ.

4,200,052

SYSTEMS FOR CONTROLLING THE POSITION OF A MOORED FLOATING VESSEL

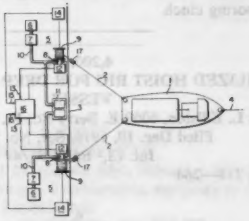
Sinclair U. Cunningham, Kinghorn; Donald Firth, and Douglas Jackson, both of East Kilbride, all of Scotland, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Dec. 14, 1977, Ser. No. 860,518

Claims priority, application United Kingdom, Dec. 14, 1976, 52165/76

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **13 Claims**



1. A system for controlling the position of a floating vessel tethered to a moorage by means of a substantially inextensible steel rope comprising:

a. winding means located on the moorage for hauling in and paying out the steel rope,

b. an energy reservoir on the moorage for receiving and storing energy from said winding means when the rope is paid out and for supplying at least some of the energy required by said winding means when the rope is hauled in,

c. tension sensing means for generating signals indicative of the tension in said steel rope,

d. length sensing means for generating signals indicative of the difference in the length of the steel rope between the said winding means and the said floating vessel from the length when the said vessel is in its desired position, and

e. a control system responsive to the signals generated by said tension sensing means to control said winding means so that the tension in said steel rope does not exceed a predetermined value and responsive to the signals generated by said length sensing means so that when the difference in length sensed has a positive value the said winding means is caused to haul in the steel rope subject to the overriding condition that the tension in the said rope does not exceed the said predetermined value.

4,200,053

MOORING CINCH

Seymour Vall, New York, N.Y., assignor to Falcon Safety Products, Inc., Mountainside, N.J.

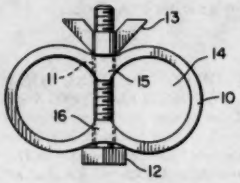
Filed Dec. 21, 1977, Ser. No. 862,957

Int. Cl.[2] B63B *21/00*

U.S. Cl. 114—230 **5 Claims**

1. A mooring cinch for securing a pennant eye to a cleat or

similar support said mooring cinch being constructed of a strong, flexible plastic material and is further characterized in having a top, bottom, a central cavity extending from one end to the other end of said cinch, and fastening means passing through centrally disposed holes in said top and bottom and passing diammetrically through said central cavity said fastening means being arranged and constructed as to provide an



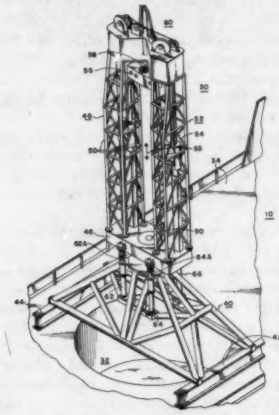
open and closed position wherein in said open position the central cavity of said mooring cinch is essentially cylindrical in shape and can internally accept both strands of said pennant eye and in said closed position is drawn towards a figure eight like configuration wherein said strands of said pennant eye are individually secured within the openings of said figure eight of said mooring cinch.

4,200,054

STABILIZED HOIST RIG FOR DEEP OCEAN MINING VESSEL

Thomas L. Elliston, 6000 E. Berry St., Ft. Worth, Tex. 76119

Filed Dec. 10, 1976, Ser. No. 748,839
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—264 **13 Claims**



5. A structure for supporting a pipe string in pendulous suspension from the slip bowl of a hoist rig in a deep ocean mining vessel comprising, in combination:

a first resilient bearing member disposed in load supporting relation intermediate the vessel and the hoist rig;

a second resilient bearing member disposed in load supporting relation intermediate the hoist rig and the slip bowl; and,

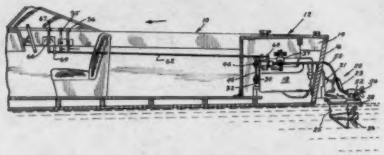
power means for angularly displacing the hoist rig with respect to the vessel to maintain vertical alignment of the hoist rig with the pipe string as the vessel rolls and pitches during pipe stabbing and removal operations performed during lowering and lifting of the pipe string.

4,200,055

TROLLING DRIVING MEANS FOR BOAT

Dale Siegel, Sauk Rapids, Minn., assignor to Hydra-Troll, Inc., Fergus Falls, Minn.

Continuation of Ser. No. 790,188, Apr. 25, 1978, abandoned.
This application Dec. 21, 1978, Ser. No. 972,038
Int. Cl.[2] B63H *5/13*
U.S. Cl. 115—18 A **8 Claims**



1. In a boat comprising a hull having a single power source, an outboard propeller assembly including a main propeller and a trolling propeller assembly, having in combination

said trolling propeller mounted in vertically spaced relation to said main propeller and being positioned and arranged to submerge when said main propeller is inoperative,

said single power source being for both propellers,

means for connection of said main propeller with said power source,

means for connection of said trolling propeller with said power source,

a control arm engaging only said first mentioned means with said power source when in one operating position and selectively engaging only said second mentioned means with said power source when in an alternate operating position,

an electro-magnetic clutch member in connection with said second mentioned means,

driving means connecting said power source and said electro-magnetic clutch member,

an electric circuit in connection with said second mentioned means and including said electro-magnetic clutch member, a switch member and an electric current source, and

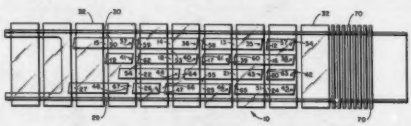
said control arm closing said switch member when in alternate operating position putting said second mentioned means in circuit with said electric current source and energizing said electro-magnetic clutch member to interengage said second mentioned means and said power source.

4,200,056

SEGMENTED PLATEN FOR APPLYING LIQUIDS TO A FLAT SURFACE

Leighton C. Johnson, Edwardsburg, Mich., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 21, 1977, Ser. No. 760,857
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—401 **10 Claims**



1. A platen for applying at least one liquid to discrete areas of a generally flat surfaced object moved along a predetermined path in spaced generally parallel relation above said platen, said platen comprising a plurality of spaced apart platen segments having substantially coplanar flat upper surfaces, said platen segments being arranged in at least two spaced apart

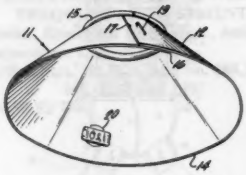
rows and being provided with liquid supply orifices at selected locations in said upper surfaces thereof.

4,200,057

SHIELD FOR TOPICALLY TREATED ANIMALS

Robert F. Agar, Lansdale, Pa., assignor to William H. Rorer, Inc., Fort Washington, Pa.

Filed Jun. 23, 1978, Ser. No. 918,413
Int. Cl.[2] A01K 29/00
U.S. Cl. 119—1 7 Claims



1. A method for testing the effect of a chemical substance applied to an area of the skin of a laboratory test animal comprising

(a) fitting a protective shield around the neck of the animal in order to inhibit its preening activity; said protective shield comprising a soft flexible non-chafing collar piece having attached thereto a wall section of flexible sheet material forming a truncated cone extending forward and outward from said collar piece enveloping the head of the animal with the slant height of said truncated cone portion being about equal to the distance between the interparietal bones and the nasal bones of said animal,

(b) applying the test substance over an area of the back of the animal or an area in the back of the ears of said animal,

(c) observing the effects of the test substance on the animal at periodic intervals following application of the test substance while maintaining the protective shield in place; and,

(d) while the shield is still in place, concluding the test by making a final observation to determine the dermal activity of the test substance unaffected by oral ingestion owing to the presence of the protective shield.

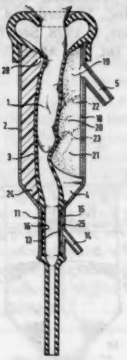
4,200,058

METHOD AND APPARATUS FOR MACHINE MILKING

Fritz Happel, 8951 Baisweil 24, Fed. Rep. of Germany

Filed May 5, 1978, Ser. No. 903,364
Claims priority, application Fed. Rep. of Germany, May 9, 1977, 2720856
Int. Cl.[2] A01J 5/04, 5/10
U.S. Cl. 119—14.01 16 Claims

1. Apparatus for machine milking using milking cups, each cup including a generally cylindrical outer cup and a resilient generally cylindrical liner located within the cup and defining an internal chamber for receiving a teat of an animal, the internal chambers of the milking cups being connected via milk discharge duct means to a milk collector, the apparatus comprising: means for applying suction via the milk discharge duct means to remove milk from the teats, and means for periodically applying pressure to an outside of the liners to massage the teats, said last mentioned means comprising in respect of each milking cup at least two hollow cushions disposed one above the other and partially surrounding the liner, a support body disposed between the liner and the cup opposite to said cushions, an inlet duct connected to an interior of said first cushion for supplying said periodically varying pressure thereto, and a restrictor connecting the interior of said first cushion to an interior of said second cushion, whereby said



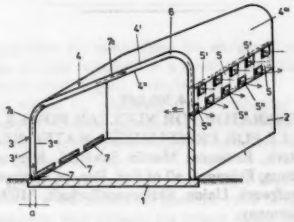
second cushion is sequentially filled after said first cushion to promote sequential massaging of the teat by the cushions.

4,200,059

ANIMAL SHELTER

Alexander Frick, Hof im grossen Riet, Schaan, Liechtenstein, and Florin Frick, Schaan, Liechtenstein, assignors to Alexander Frick, Schaan, Liechtenstein

Filed Sep. 25, 1978, Ser. No. 945,705
Claims priority, application Austria, Sep. 28, 1977, 6931/77
Int. Cl.[2] A01K 1/00; F24F 7/00
U.S. Cl. 119—16 12 Claims



1. A stable building comprising:

(a) wall means bounding an animal shelter in said building and normally separating said animal shelter from the ambient atmosphere,

(1) a vertically extending portion of said wall means including an outer shell and an inner shell defining a space therebetween,

(2) said inner shell being formed with an opening connecting said space with said shelter; and

(b) heat exchanger means mounted on said wall means and defining first and second, separate conduits,

(1) said first conduit connecting a portion of said space remote from said opening with said atmosphere for discharge of exhaust air from said shelter,

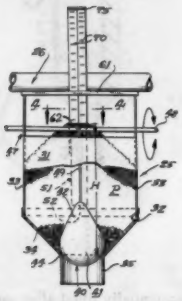
(2) said second conduit connecting said atmosphere with said shelter for flow of fresh air into said shelter in thermal contact with said exhaust air.

4,200,060

HOG FEEDER

Antoine Van Daele, Maldegem, Belgium, assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Nov. 9, 1978, Ser. No. 959,297
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—56 R **10 Claims**



1. A feeder for livestock and the like, comprising, in combination, feed receiver body means for receiving and storing a flow of feed from a conveyor in communication with the feeder, discharge valve means in communication with the receiver body to alternatively permit and inhibit feed discharge action from the feeder, and drop tube means extending from the feed conveyor into the feed receiver body means, the drop tube means including at least one drop tube fixed wall and at least one drop tube moveable wall mounted for vertical motion relative to the drop tube fixed wall, the walls, when the moveable wall is in the raised position, defining a vertically oriented opening through which feed can enter the receiver body.

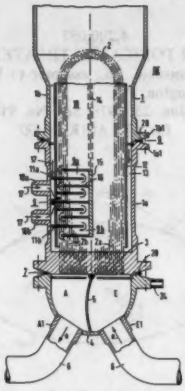
4,200,061

STEAM GENERATOR FOR NUCLEAR POWER PLANTS, ESPECIALLY FOR PRESSURIZED WATER REACTORS

Zvonimir Sterk, Erlangen; Martin Sawitzki, Röttenbach, and Heinz Grimm, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,022
Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735450
Int. Cl.[2] F22B *1/02*; F28F *7/00, 9/02*
U.S. Cl. 122—32 **11 Claims**

1. Steam generator for nuclear power plants comprising a cylindrical housing, a tube bundle for conducting primary medium enclosed by said housing, at least one tube support plate holding said tube bundle, said cylindrical housing including a base member secured to said tube support plate and defining therewith inlet and outlet chambers for the primary medium, said cylindrical housing having a pair of opposing flanges on portions of said cylindrical housing located on opposite sides of said tube support plate, and flange connection means for tightly connecting said portions of said cylindrical housing on opposite sides of said tube support plate, said flange connection means being releasable for assembling and disassembling said tube bundle and comprising a stud bolt connection, said flanges having opposing sealing surfaces, a lip seal disposed between said sealing surfaces and having radially outwardly protruding lips tightly welded to one another, said



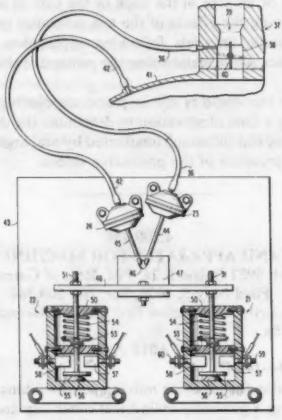
lips having a radially inner region secured by respective circular bead welds to said flanges.

4,200,062

SAFETY SWITCH FOR HYDROGEN GENERATOR SYSTEM

Charles E. Duckworth, 1421 SE. 10th St., Deerfield Beach, Fla. 33441

Filed Jul. 12, 1978, Ser. No. 923,863
Int. Cl.[2] F02B *43/08*
U.S. Cl. 123—1 A **5 Claims**



1. A safety cutoff switch for use in a hydrogen generating system supplying hydrogen gas as a supplemental fuel to an internal combustion engine, said hydrogen generating system comprising at least one group of fuel cells connected through said safety cutoff switch to a source of electrical current and said internal combustion engine having an intake manifold and a carburetor comprising a venturi and a throttle valve, said carburetor being attached to said intake manifold for supplying a fuel and air mixture to said engine, said safety cutoff switch comprising:

a first vacuum actuator means connected by a hose to said carburetor venturi;

a second vacuum actuator means connected by a hose to said intake manifold; and

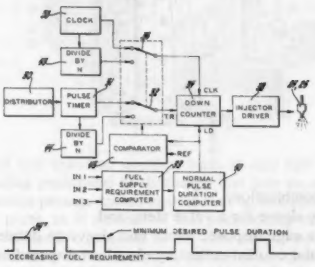
switch means mechanically connected to both of said first and second vacuum actuators for actuation thereby to make an electrical connection between said group of fuel cells and said source of electrical current when said engine is running, said switch means breaking said electrical connection in the absence of actuation by both of said first and second vacuum actuator means.

4,200,063

ENGINE FUEL INJECTION CONTROL APPARATUS WITH SIMULTANEOUS PULSE WIDTH AND FREQUENCY ADJUSTMENT

Lauren L. Bowler, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 20, 1978, Ser. No. 888,244
Int. Cl.² F02B 3/00
U.S. Cl. 123—32 EF **2 Claims**



1. In a fuel injected vehicle engine including means effective to generate fuel injection pulses at first predetermined times separated by first intervals, the pulses having first variable durations the magnitude of which are determined by control means in accordance with engine fuel flow requirements and said first intervals, the engine further including means responsive to said pulses to inject fuel into the engine for the duration of said pulses, the injecting means thereby providing fuel to the engine in accordance with the requirements thereof but with an accuracy tending to decrease with decreasing pulse duration, the improvement comprising:

means responsive to the first time duration of each of said fuel injection pulses as determined by said control means and effective, when said first pulse time duration is shorter than a predetermined minimum desired pulse duration, to generate and apply to the injecting means alternate fuel injection pulses having second intervals therebetween and second durations both increased by a common factor N from the first intervals and first durations, respectively, whereby the accuracy of the fuel injecting means is increased at low fuel supply rates.

2. In a fuel injected vehicle engine including means to inject fuel into the engine for the duration of fuel injection pulses with an accuracy tending to decrease with decreasing duration of said fuel injection pulses, apparatus for generating said fuel injection pulses comprising, in combination:

first means effective to generate first fuel injection timing pulses at predetermined times separated by first time intervals;

second means for generating first clock pulses at a first rate faster than that of the first fuel injection timing pulses;

third means responsive to one or more engine operating parameters to repetitively compute a required fuel flow rate and generate fuel pulse numbers representative thereof;

fourth means effective to compare said fuel pulse numbers to a reference indicative of a minimum desired fuel injection pulse duration and generate a first output when the numbers are less than said reference and a second output when the numbers are greater than said reference;

fifth means responsive to the first clock pulses to generate alternative clock pulses at a rate slower than the rate of said first clock pulses by a factor N;

sixth means responsive to the first means to generate alternative fuel injection timing pulses separated by intervals which are a multiple N of the first intervals;

seventh means effective to generate a fuel injection pulse beginning with each fuel injection timing pulse and having duration equal to a fuel pulse number of clock pulses;

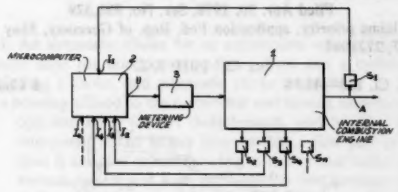
eighth means responsive to the comparator to provide the first clock pulses and first fuel injection timing pulses to the seventh means while the comparator is in its first state and to provide the alternative clock pulses and alternative fuel injection timing pulses to the seventh means when the comparator is in its second state, whereby the fuel injection means can provide fuel accurately even when the first fuel injection pulse duration would be less than the minimum desired pulse duration.

4,200,064

ELECTRONIC APPARATUS FOR FEED CONTROL OF AIR-GASOLINE MIXTURE IN INTERNAL COMBUSTION ENGINES

Horst Engele, Tedesca, Italy, assignor to Fabbrica Italiana Magneti Marelli S.p.A., Milan, Italy

Filed Apr. 21, 1978, Ser. No. 898,545
Claims priority, application Italy, Apr. 27, 1977, 22843 A/77
Int. Cl.² F02B 3/00
U.S. Cl. 123—32 EB **13 Claims**



1. An apparatus for controlling the air/gasoline ratio of an air-gasoline mixture supplied to a combustion chamber of an internal combustion engine, comprising:

metering means for adjusting the air/gasoline ratio of an air-gasoline mixture supplied to a combustion chamber of an internal combustion engine responsive to a control signal applied thereto;

exhaust gas sensor means for generating a first signal representative of the actual air/gasoline ratio of said air-gasoline mixture, said exhaust gas sensor means being capable of generating univocal values of said first signal only for air/gasoline ratios which fall within a predetermined range about the stoichiometric value of said air/gasoline ratio;

characteristic parameter sensing means for generating second signals representative of the value of characteristic operating parameters of said engine;

storage means for storing a plurality of first values of said control signal, each of said first values of said control signal corresponding to a different combination of said characteristic operating parameters and being predetermined to cause said metering means to adjust said air/-gasoline ratio in such a manner that said engine operates in a desired manner for that combination of characteristic operating parameters with which it corresponds, said stored first values of said control signal including values which will cause said metering means to adjust the value of said air/gasoline ratio to values which fall outside of said predetermined range of air/gasoline ratios;

control means for applying said control signal to said metering means, the value of said control signal corresponding to that one of said stored first values which corresponds to said combination of characteristic parameters which is sensed by said characteristic parameter sensing means; and

calibration means for periodically updating the values of said first stored values by comparing the actual value of said control signal which must be applied to said metering means to cause said metering means to adjust said air/-gasoline ratio to said stoichiometric value with a second stored value of said control signal which has been predetermined to cause said metering means to adjust said air/-gasoline ratio to reach said stoichiometric value for that combination of characteristic parameters which is sensed by said characteristic parameter sensor means.

4,200,065

METHOD FOR PREVENTING UNDESIRABLE HEAT LOSSES IN A COOLING SYSTEM FOR LIQUID-COOLED VEHICULAR INTERNAL-COMBUSTION ENGINES

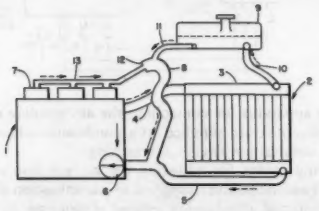
Uwe Buddenhagen, Munich, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,329

Claims priority, application Fed. Rep. of Germany, May 11, 1977, 2721064

Int. Cl.[2] F01P *3/22*

U.S. Cl. 123—41.54 8 Claims



1. In a cooling system for a liquid-cooled internal combustion engine having a cooling medium circuit in which the engine is connected to a radiator through a cooling medium inlet conduit having a thermostat arranged therein, a pump pumps cooling medium through a cooling medium return conduit, a header tank is connected with the radiator and is also connected through a vent conduit to a vent connection on the engine, the improvement comprising:

(a) said vent connection (13) being connected through a further cooling medium conduit (8) to a portion of the cooling medium circuit having a lower pressure than that at said vent connection (13) thereby forming a pressure gradient along said cooling medium conduit (8), with one location therein having a pressure (p) equal to the pressure at the inlet of the vent conduit (11) to the header tank (9,3); and

(b) said vent conduit (11) being connected to the cooling medium conduit (8) at said location having the pressure (p), whereby circulation of coolant through said vent conduit (11) is prevented by said equalization of pressures.

4,200,066

INTERNAL COMBUSTION PISTON ENGINE

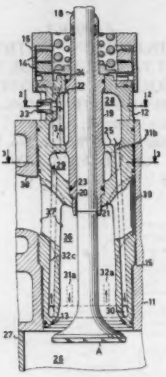
Ernst Berchtold, Nanikon-Greifensee, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Dec. 29, 1977, Ser. No. 865,516

Claims priority, application Switzerland, Jan. 28, 1977, 1065/77

Int. Cl.[2] F01L *3/00*

U.S. Cl. 123—41.31 3 Claims



1. In combination;

a guide sleeve for a valve stem; and

a valve cage disposed about said sleeve to define a pair of annular coolant collecting chambers disposed in coaxially spaced relation along said cage, said cage having a valve seat at one end, a cooling chamber adjacent said seat, a plurality of supply ducts between one of said coolant collecting chambers and said cooling chamber to deliver coolant to said cooling chamber, a plurality of return ducts between said cooling chamber and the other of said coolant collecting chambers to discharge coolant from said cooling chamber, and a wall surrounding said collecting chamber closest to said cooling chamber, said wall having a plurality of portions projecting into said collecting chamber and having said return ducts extending therethrough, said supply and return ducts being disposed circumferentially of said cage in alternating relation to each other.

4,200,067

HYDRAULIC VALVE ACTUATOR AND FUEL INJECTION SYSTEM

Myron U. Trenne, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

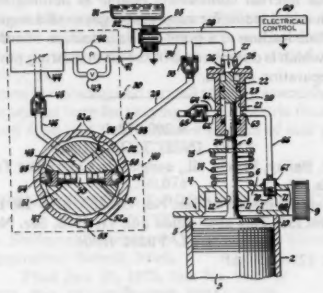
Filed May 1, 1978, Ser. No. 901,715

Int. Cl.[2] F01L *9/04;* F02B *75/02*

U.S. Cl. 123—90.12 5 Claims

1. A hydraulic valve actuator and fuel injection system for use in an internal combustion engine having an engine housing means with an N number of cylinders each with a piston therein connected to the crankshaft of the engine, said housing means having induction passage means therein connected by inlet ports to said cylinders, an N number of spring biased, normally closed inlet valves controlling flow through said inlet ports, said hydraulic valve actuator and fuel injection system including a source of hydraulic fluid, an N number of cylinder means in said housing means, a hydraulic actuator piston in each said cylinder means operatively connected to one of said inlet valves, a distributor type, liquid pump having an inlet connected to said source of hydraulic fluid and an N number of outlets, an N number of conduit means each with a one-way valve therein connecting said outlets to said cylinder means,

said pump being operatively connected to said crankshaft to be driven thereby for delivering measured charges of hydraulic fluid under high pressure sequentially to said cylinder means on the side of said actuator pistons opposite said valve, an N number of branch conduit means each with a normally, open solenoid valve operatively connectable to a source of electrical power controlling flow therethrough, each said branch conduit means being connected at one end to one of said conduit means intermediate said one-way valve and its associated cylinder means and at its other end being in flow communication with said source of hydraulic fluid, fuel supply means, an N



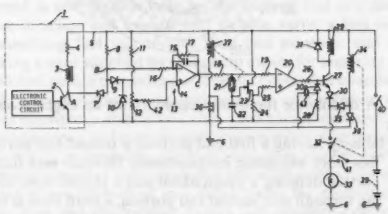
number of fuel injection nozzles, each of said fuel injection nozzles being positioned to discharge fuel into an associated said induction passage means upstream of an associated one of said inlet ports, an N number of fuel pressurizing means each having a fuel inlet connected to said fuel supply means and a fuel outlet connected to its associated one of said fuel injection nozzles, each said fuel pressurizing means being operatively associated with one of said actuator pistons whereby to supply pressurized fuel to an associated fuel injection nozzle as an associated said inlet valve is open by an associated said actuator piston.

4,200,068

ELECTRONIC ROTATION SPEED CONTROL SYSTEM FOR ENGINES

Naoji Sakakibara, Chiryu, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Apr. 20, 1978, Ser. No. 898,083
Claims priority, application Japan, Apr. 21, 1977, 52/46472
Int. Cl.[2] F02D *37/00*
U.S. Cl. 123—102 **4 Claims**



1. A control system for electrically controlling rotational speed of an engine having a throttle valve to control an amount of air sucked into said engine and a fuel injection control apparatus to produce an output signal related to the actual rotational speed and torque of said engine and including means for controlling fuel injection frequency and duration in response to the output signal, the control system comprising:

an integration circuit for integrating the output signal from said fuel injection control apparatus to generate an integrated signal indicative of the actual rotational speed and torque of said engine;

setting means for setting an instant value of the integrated signal as a command signal indicative of a desired set speed;

a comparator coupled with said integration circuit and said setting means for comparing the integrated signal with the command signal to produce an output signal therefrom; and

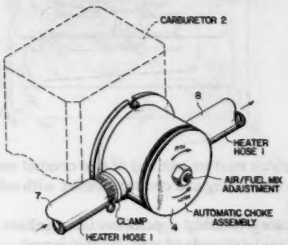
a servomotor for controlling the opening angle of said throttle valve in response to the output signal from said comparator to operate said engine at the desired set speed.

4,200,069

AUTOMATIC CHOKE

Kenneth L. Paulin, Sr., RFD #7, Augusta, Me. 04330

Filed Feb. 17, 1978, Ser. No. 878,508
Int. Cl.[2] F02M *1/10*
U.S. Cl. 123—119 F **4 Claims**



1. An automatic choke for an automotive vehicle having a heater hose for conducting radiator fluid and a carburetor including a choke, said automatic choke comprising

a housing affixed to the carburetor and having diametrically opposite holes formed therethrough, said housing being interposed in the heater hose so that a first part of said hose is coupled to said housing at one of said holes and a second part of said hose is coupled to said housing at the other of said holes and radiator fluid flowing through the hose flows through said housing, said housing having a front and a spaced substantially parallel back;

a thermal member in the housing having a plurality of thermal fins extending therefrom for concentrating heat of fluid flowing through said housing;

a shaft rotatably mounted in the thermal member in the housing, said shaft having spaced opposite first and second ends extending beyond the front and back, respectively, of said housing; and

a bimetallic substantially spiral spring having one end affixed to the second end of said shaft outside said housing and wound around said shaft at the thermal member in a manner whereby said spring is surrounded by, but spaced from, radiator fluid flowing through said housing, said bimetallic spring being coupled to the choke of the vehicle in the carburetor whereby the choke is controlled by the condition of said spring which depends upon the temperature of fluid flowing through said hose.

4,200,070

FUEL/AIR MIXTURE CONTROL FOR SUPERCHARGED INTERNAL COMBUSTION ENGINES

Gene A. Racine, 945 Novarro St., West Covina, Calif. 91791

Filed May 19, 1978, Ser. No. 907,794
Int. Cl.[2] F02M *31/00*
U.S. Cl. 123—122 AC **4 Claims**

1. In combination with an internal combustion engine having a fuel/air induction conduit means,

said conduit means including an intake manifold at one end thereof,

means in said conduit means forming a source of heat,

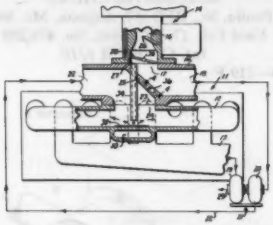
a carburetor at the opposite end of said conduit means,

said carburetor having an idle speed device for supplying an idle-speed fuel/air mixture, a high-speed device for supplying a high-speed fuel/air mixture, and valve means for selectively causing operation

of said idle-speed device and said high-speed device;

of a casing intermediate said carburetor and said intake manifold,

the fuel/air mixture entrance end of said conduit means extending into said casing and communicating with said carburetor,



the fuel/air mixture exit end of said conduit means extending into said casing and communicating with said intake manifold,

said casing forming a partition intermediate said entrance and said exit ends of said conduit means,

supercharging means connected in said conduit means, and

means forming a transfer passage extending through said partition,

said transfer passage having an entrance end adjacent said idle-speed device and an exit end adjacent said heat source for directing said idle-speed fuel/air mixture against said hear source when said valve means causes said idle-speed device to supply said idle-speed air/fuel mixture.

4,200,071

EXHAUST GAS CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

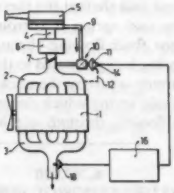
Helmut Maurer, Schwieberdingen; Ernst Linder, Mühlacker, and Gerhard Dillmann, Markgröningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,491

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657608

Int. Cl.[2] **F02D** *35/00*; **F02M** *25/06*

U.S. Cl. 123—124 R **15 Claims**



1. In an internal combustion engine, said engine including an induction manifold and an exhaust manifold, a conduit for supplying a gas to said engine and a pneumatically actuated throttle in said conduit for varying the amount of said gas supplied to said engine, means for sensing the exhaust gas composition and control means for changing the actuation pressure in said pneumatically actuated throttle as a function of said exhaust gas composition, the improvement comprising:

said pneumatically actuated throttle includes a pressure chamber which is connected by gas lines to at least two sources of pressure, the terminus of at least one of said gas lines being closable to varying degrees by elastic means, said elastic means being at least part of the armature of an electromagnet, said electromagnet being connected to and energized by said control means and said control means energizing said electromagnet with a voltage of variable frequency, said frequency being dependent on said exhaust gas composition.

13. An internal combustion engine as defined by claim 1, wherein said conduit for supplying a gas to said engine is an air bypass line leading to a point in the induction manifold of said engine which is downstream of the air measuring portion of the fuel preparation system.

4,200,072

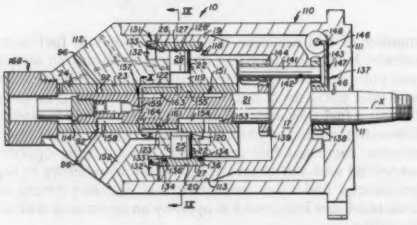
FUEL INJECTION PUMP

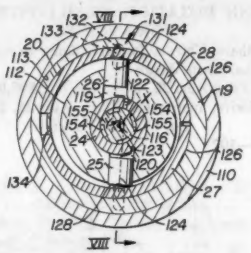
John M. Bailey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 798,053, May 18, 1977, Pat. No. 4,108,130. This application Jul. 11, 1978, Ser. No. 923,171

Int. Cl.[2] **F02M** *41/06*

U.S. Cl. 123—139 AP **26 Claims**





1. A distributor fuel pump assembly for an engine comprising:

a housing having a first end portion, a second end portion, a first bore extending longitudinally through said first end portion defining a longitudinal axis a second bore extending through said second end portion, a third bore in one of said first and second end portions coaxial with said first bore, and a plurality of outlet ports and inlet passage means in communication with said second bore;

a first rotating assembly journaled for rotation in said third bore and having a shaft rotatably extending outwardly through said first bore and an inner eccentric bore proximate said second end portion;

a second rotating assembly rotatably and slidably positioned in said second bore;

pump means in said second end portion for increasing the pressure of fuel communicated thereto, said pump means

including a bore in said second end portion, a piston slidably positioned in said bore defining a fluid chamber at an inner end of said piston, and a slipper element positioned between said piston and said inner eccentric bore;

a gear assembly drivingly interconnecting said first and second rotating assemblies for rotating said second rotating assembly in response to rotation of said first rotating assembly and at a speed proportional to the rotational speed of said first rotating assembly;

first means for alternately establishing and blocking communication between said inlet passage means and said fluid chamber in response to rotation of said second rotating assembly;

second means for periodically directing fluid from said fluid chamber to each of said outlet ports in a predetermined sequence in response to rotation of said second rotating assembly; and

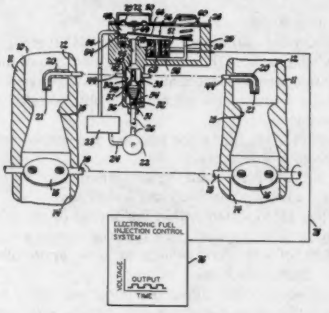
third means for moving said second rotating assembly axially in said second bore for varying the volumetric flow of fuel directed from said fluid chamber to each of said ports.

4,200,073

ELECTRONIC THROTTLE BODY FUEL INJECTION SYSTEM

Donald D. Stoltman, Henrietta, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1978, Ser. No. 916,755
Int. Cl.[2] F02B *3/00*; F02M *39/00*
U.S. Cl. 123—139 AW **2 Claims**



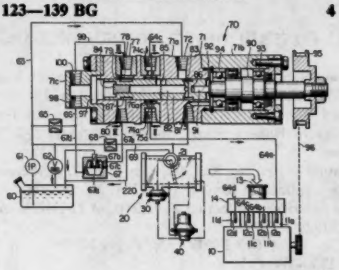
1. A throttle body fuel injection system comprising a carburetor having a throttle bore, a throttle valve mounted in said throttle bore for controlling flow therethrough, a fuel nozzle mounted in said throttle bore for discharging fuel in a downstream direction and toward said throttle valve, a fuel pump for supplying fuel at constant flow and pressure, and fuel metering means supplied by said pump means for metering fuel to said fuel nozzle comprising a pressure controlled chamber, a check valve for connecting said pump to said pressure controlled chamber, a nozzle feed port open to said pressure controlled chamber and continuously connected to said fuel nozzle, a regulator chamber, a bypass port open to said pressure controlled chamber and connected to said regulator chamber, jet means downstream of said check valve for receiving the pump flow and discharging it into said pressure controlled chamber and toward said bypass control port, a return port open to said regulator chamber and connected to return fuel to said pump, regulator valve means for periodically closing said bypass port to said regulator chamber comprising a magnetic valve element movable to open and close said bypass port and an electromagnet operable on energization to close said magnetic valve element against the fluid force from the jet discharge, and air pressure responsive bias means for determining the force required to open said valve element so that when said electromagnet is periodically energized said valve operates to open and close to cause the pressure in said pressure controlled chamber to vary between a value which induces fuel flow through said fuel nozzle and a value which substantially does not.

4,200,074

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Tooru Kosuda, Okazaki; Michihiro Ohashi, Handa, and Hiromi Katou, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 19, 1978, Ser. No. 907,620
Claims priority, application Japan, May 23, 1977, 52/60313
Int. Cl.[2] F02M *41/04*
U.S. Cl. 123—139 BG **4 Claims**



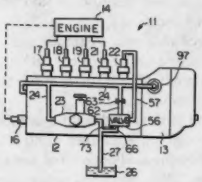
1. A fuel metering and distributing device for use in a fuel injection system for an internal combustion engine, comprising a housing having a fuel inlet port and fuel outlet ports formed therein; a plunger mounted in said housing rotatably and axially movably to meter the fuel from said fuel inlet port and distribute the metered fuel to said fuel outlet ports, two hydraulic pressure chambers disposed at respective axial ends of said plunger, the hydraulic pressures in said hydraulic pressure chambers determining the axial displacement of said plunger, an intake air flow-hydraulic servo mechanism having a first variable orifice operative in response to a change of the intake air flow rate to vary the hydraulic pressure in one of said pressure chambers, and a second variable orifice for controlling the hydraulic pressure in the other pressure chamber in accordance with the axial displacement of said plunger, whereby said plunger is axially moved to a position where the hydraulic pressures in said pressure chambers are balanced.

4,200,075

FUEL INJECTION APPARATUS

Kenji Takahashi; Takasuke Kumagai, and Kazuyoshi Takaichi, all of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 887,888
Claims priority, application Japan, Mar. 22, 1977, 52/31408
Int. Cl.[2] F02D *1/04*; F02M *39/00*
U.S. Cl. 123—140 FG **15 Claims**



1. A fuel injection apparatus for an internal combustion engine comprising:

a fuel supply pump having an inlet and an outlet;
a first fuel injection pump connected to the outlet of the fuel supply pump for injecting fuel into the engine, the first fuel injection pump having a fuel injection volume control member;
a liquid abutment regulator means comprising a second fuel injection pump connected to the outlet of the fuel supply pump for modulating an output pressure of the fuel supply pump in accordance with engine speed; and
actuator means for positioning the control member in accordance with the output pressure.

4,200,076

FUEL CONTROL DEVICE FOR SUPERCHARGED DIESEL ENGINES

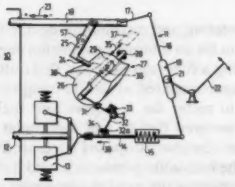
Max Straubel, Stuttgart; Klaus-Dieter Zimmermann, Vaihingen; Wolf Wessel, Oberriexingen; Wilfried Sautter, Ditzingen, and Gerhard Stumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 822,502, Aug. 8, 1977, abandoned. This application May 4, 1979, Ser. No. 36,108

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1976, 2637520

Int. Cl.[2] F02D *1/04*; F02N *17/08*

U.S. Cl. 123—140 CC **13 Claims**



1. A fuel controller for fuel-injected, turbo-charged diesel engines including an injection pump for admitting fuel to the engine and containing fuel control means for adjusting the amount of fuel so admitted, with an rpm governor which determines a setting of the fuel control means of the injection pump, which governor has a service lever and a regulator member which is displaceable in dependence on the rpm and coupled to the control means and the controller is provided with a control apparatus serving as a full-load stop, said rpm governor being coupled to said fuel-control means through said service lever and said regulator member for determining the setting of said fuel control means independently of said control apparatus and wherein the control apparatus comprises:

a control cam disposed for rotation about a shaft attached to said controller, and disposed for linear displacement along the axis of said shaft;
a first control element, responsive to engine speed (rpm) for adjusting one of said rotation or said linear displacement of said control cam;
a second control element, generating an actuating force, directly responsive to the air flow rate into said engine, for adjusting the other of said rotation or said linear displacement of said control cam;
said control cam is provided with a contoured surface and there is disposed on said fuel controller cam follower means for following said contoured surface of said control cam, said cam follower means being coupled to said fuel control means for limiting the maximum amount of fuel admitted to the engine under full-load conditions for any given set of values of said engine speed (rpm) and said air flow rate.

4,200,077

GLOW PLUG STRUCTURE

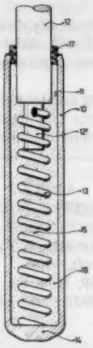
Günther Kauhl, Affalterbach; Hannes Pflug, Gerlingen, and Leo Steinke, Waiblingen-Hegnach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 942,045

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746595

Int. Cl.[2] H05B *3/00*

U.S. Cl. 123—145 A **6 Claims**



1. Glow plug structure comprising
a tubular housing (10) closed at one end (14) thereof;
a spiral heating wire (13) comprising at least one of: molybdenum; tungsten connected at one end to the closed end of the tubular housing and extending axially, spirally within the housing;
and a filler (15, 16) filling the housing and embedding the spiral heating wire therein,
wherein, in accordance with the invention,
the filler is radially compacted and comprises
a first section (15) located within the outline of the spiral of the heating wire and made of a material having a thermal coefficient of expansion which at least approximately matches that of the heating wire;
and another section (16) filling the remaining space within the housing between the heater wire and the inner walls of the housing and made of a material having a good heat conductivity which is higher than that of the material of said first section.

4,200,078

C. D. IGNITION SYSTEM WITH ACTIVE PULSE DISCRIMINATING MEANS

David T. Cavil, Menomonee Falls, and William R. Krueger, Hartford, both of Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

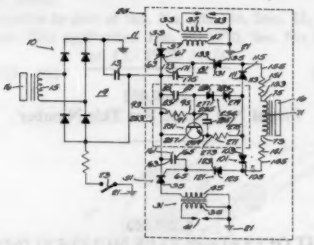
Filed Mar. 6, 1978, Ser. No. 883,914

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—148 CC **15 Claims**

1. An engine ignition system comprising a charge capacitor, means for periodically charging said capacitor, first and second ignition coils respectively including first and second primary windings and first and second secondary windings connected respectively to first and second spark plugs, first and second electronic switches respectively including first and second anodes connected respectively to first and second primary windings, first and second cathodes connected to said charge capacitor, and first and second control elements operable, upon application thereto of a trigger current pulse, to cause said first and second switches to be conductive, rotary pulse generator means including a relatively rotatably magnet and trigger coil for generating trigger voltage pulses in response to

engine rotation, said trigger coil having first and second ends respectively connected to said first and second control elements, a first diode having a cathode connected to and between said first end of said trigger coil and said first control element and having an anode, and a second diode having a cathode connected to and between said second end of said trigger coil and said control element, and having an anode, and active pulse discriminating means for preventing false triggering of said switches comprising an active filter circuit including a blocking capacitor having a first plate connected to said first and second switch cathodes and having a second plate, a resistor having a first end connected to said first and second switch cathodes and having a second end, said blocking capacitor



developing a blocking voltage when a trigger voltage pulse is applied to said first plate, said filter circuit also including current control means having a first terminal connected to said first and second switch cathodes and said first plate of said capacitor and to said first end of said resistor, a second terminal connected to said second plate of said capacitor and to said second end of said resistor, and a third terminal connected to and between said anodes of said first and second diodes, said current control means being rendered conductive so that a trigger current pulse sufficient to render one of said switches conductive flows between said first and third terminals and through said trigger coil when a trigger voltage pulse exceeds said blocking voltage and a control current is applied to said second terminal.

4,200,079

ENGINE OIL PRESSURE OPERATED SYSTEM

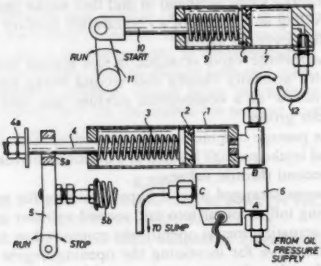
Jack Darlington, Southampton, England, assignor to Petter Power Generation Limited, Hamble, England

Filed Jun. 9, 1978, Ser. No. 914,613

Claims priority, application United Kingdom, Jun. 9, 1977, 24165/77

Int. Cl.[2] F02N *17/00*; F01L *13/08*

U.S. Cl. 123—179 G **7 Claims**



1. In a compression-ignition internal combustion engine which includes a fuel-injector pump having a control member which is selectively operable to a "run" position and a "stop" position such that fuel is injected into at least one engine cylinder in the "run" position of the control member and such that no fuel is injected into the at least one engine cylinder in the "stop" position of the control member, the engine also including an oil pump for pumping lubricating oil under pressure around the engine, the provision of an engine oil pressure-operative system for starting and stopping of said compression-ignition internal combustion engine by moving said control member of said fuel injector pump respectively to said "run" position and said "stop" position, comprising:

an oil pressure-operative device connected to the control member and arranged to be supplied with oil from the engine so as to be responsive to oil pressure from said engine in order to move the control member to the "run" position;

the system including a return spring which is operative absent oil pressure from said device to move the control member to the "stop" position; and

valve means selectively operable firstly for supplying oil pressure from the oil pump to said device and secondly for alternatively connecting said device to drain.

4,200,080

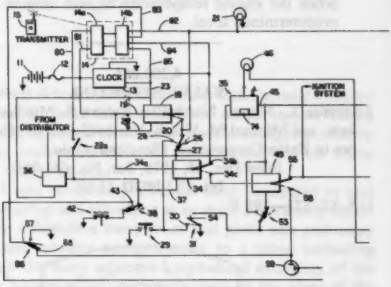
AUTOMATIC STARTING SYSTEM

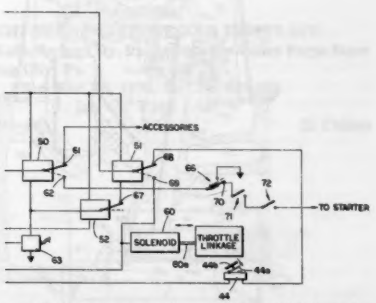
Norman E. Cook, 9025 Broken Arrow Rd., Indianapolis, Ind. 46234, and William L. Kirby, 1160 W. Cedar Bluff, Bloomington, Ind. 47401

Filed Jul. 14, 1978, Ser. No. 924,491

Int. Cl.[2] F02N *15/00*

U.S. Cl. 123—179 BG **26 Claims**





1. An automatic starting system for a vehicle which includes a starter circuit, a battery and an internal combustion engine with a throttle-gas pedal linkage, said starting system comprising:

system energizing means electrically connectable to the battery of said vehicle, said system energizing means being selectively actuatable for conducting a current signal from said battery;

a plurality of switch means designed and arranged and elec-

trically operable to couple said current signal from said system energizing means to the starter circuit of said vehicle;

solenoid means connectable to the throttle-gas pedal linkage of said vehicle; and

means for alternately energizing and deenergizing said solenoid means for a finite time interval, thereby creating a pumping action of said throttle-gas pedal linkage, said energizing and deenergizing means includes a thermal switch flasher and said plurality of switch means are cooperatively arranged with said energizing and deenergizing means such that said pumping action occurs in response to operation of said thermal switch flasher.

12. An automatic starting system for a vehicle which includes a starter circuit, a battery and an internal combustion engine with a throttle-gas pedal linkage, said starting system comprising:

system energizing means electrically connectable to the battery of said vehicle, said system energizing means being selectively actuatable for conducting a current signal from said battery;

a plurality of switch means designed and arranged and electrically operable to couple said current signal from said system energizing means to the starter circuit of said vehicle;

solenoid means connectable to the throttle-gas pedal linkage of said vehicle;

means for alternately energizing and deenergizing said solenoid means for a finite time interval, thereby creating a pumping action of said throttle-gas pedal linkage; and

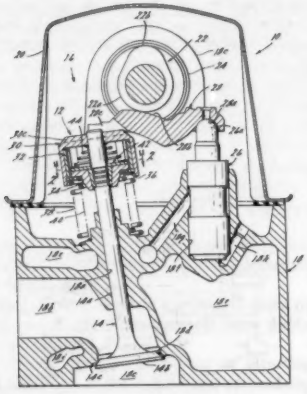
means for bypassing said energizing and deenergizing means when the engine temperature of said vehicle is above a predetermined level.

4,200,081

VALVE SELECTOR

Lawrence L. Meyer, Northville; Robert S. Mueller, Birmingham, and Michael M. Walsh, Northville, all of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 15, 1975, Ser. No. 641,004
Int. Cl.[2] F02D *13/06*
U.S. Cl. 123—198 F **19 Claims**



1. An improved valve disabling device in a machine of the type having a valve which is normally opened and closed in response to pivotal movement of a rocker arm, said improved disabling device comprising:

drive means drivingly interposed between one end of said rocker arm and said valve and in contact with said one end of said rocker arm;

latch means moveable from a valve enabling position preventing relative movement between said drive means and said valve for enabling said valve for normal opening and closing and moveable to a valve disabling position allowing relative movement between said drive means and said valve for disabling said valve;

first resilient means for biasing said drive means towards said one end of said rocker arm independent of the position of said latch means;

second resilient means for biasing said valve toward the closed position; and

means operative to apply at least a portion of the biasing force of said first resilient means to said valve in the closing direction when said latch is in said valve enabling position.

4,200,082

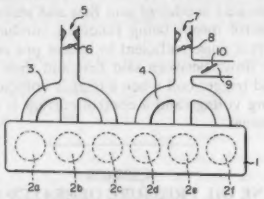
Patent Not Issued For This Number

4,200,083

SPLIT OPERATION TYPE MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yasuhiko Ishida, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 10, 1978, Ser. No. 949,540
Claims priority, application Japan, Jul. 6, 1978, 53/81422
Int. Cl.[2] F02D *17/00*
U.S. Cl. 123—198 F **13 Claims**



1. An internal combustion engine having a plurality of cylinders which are divided into a first cylinder group and a second cylinder group, said first cylinder group having a first intake passage and a first fuel supply means, said second cylinder group having a second intake passage and a second fuel supply means, said engine comprising:

a first throttle valve arranged in said first intake passage for controlling an amount of a combustible mixture fed into said first cylinder group;

a second throttle valve arranged in said second intake passage for normally closing said second intake passage to stop inflow of a combustible mixture into said second cylinder group;

a bypass passage communicating the atmosphere with said second intake passage located at a position downstream of said second throttle valve;

valve means arranged in said bypass passage for normally allowing inflow of air into said second cylinder group;

a valve actuating means operatively connected to said first throttle valve for increasing the opening degree of said first throttle valve in accordance with an increase in the level of a load of said engine and intermittently connected to said second throttle valve for increasing the opening degree of said second throttle valve in accordance with an increase in the level of the load of said engine when said second throttle valve is connected to said valve actuating means; and,

vacuum-operated control means for establishing mechanical connection between said valve actuating means and said second throttle valve to allow inflow of the combustible mixture into said second cylinder group and for causing the closing operation of said valve means to stop inflow of air into said second cylinder group when the level of the vacuum produced in said first intake passage is reduced below a predetermined level.

4,200,084

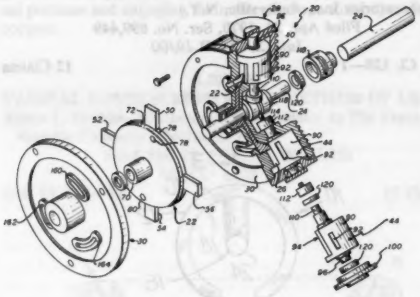
ROTARY PISTON ENGINE

Kirill M. Alexeev, and Antonina I. Alexeev, both of 415 E. 52nd St., N.Y. 10022

Continuation-in-part of Ser. No. 750,244, Dec. 13, 1976, abandoned. This application Jan. 16, 1978, Ser. No. 870,010

Int. Cl.[2] F02B *53/00*

U.S. Cl. 123—222 **14 Claims**



1. A rotary combustion engine comprising:

(a) disc means, a main shaft carrying said disc means, means to permit rotation of said disc means and shaft including:

(b) cover means and housing means being disposed with said disc means therebetween;

(c) a plurality of piston lugs extending radially from said disc means into an annular channel formed between said cover means and said housing means; and

(d) a plurality of combustion means, each disposed between said housing means and said cover means for co-action with each of said piston lugs;

(e) each said combustion means including combustion chamber means and a spark plug, means to move said combustion chamber means between a first position in communication with said annular channel and in alignment with said spark plug carried by said housing means for combustion, and a second position in communication with said annular channel but not aligned with said spark plug, said combustion chamber means being movable in operable association with the disc means but without contact therewith in said first position.

4,200,085

DOLLY-TYPE HEATING DEVICE WITH HEATER SECTION ADJUSTABILITY

Arnold L. Buehl, Solon, Ohio, assignor to Econoray Inc., Solon, Ohio

Filed Jun. 29, 1978, Ser. No. 920,488

Int. Cl.[2] F24C *1/16*

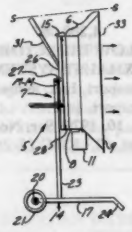
U.S. Cl. 126—9 B **10 Claims**

1. A dolly-type heating device comprising:

a heater having an elongate housing comprising end walls and side walls, and heat-radiating means supported within the housing substantially along its entire length, said side walls defining an elongate side opening opposite a closed side through which radiant energy may pass from said housing;

a dolly comprising a base having at least three spaced floor-engaging means of which two are means defining a tilting axis for the device in generally parallel proximity with a plane of engagement with a floor; a mast member having a lower end fixed to said base and extending upwardly to a point centrally overhead said floor-engaging means, the upper portion of which comprises pivot joint means;

a tilt frame comprising a main member having pivot joint means and means for connecting the tilt frame to said heater housing; and tie means for pivotally connecting said pivot joint means; said pivot joint means and said tie means being aligned along a pivot axis parallel to said plane;



quick-release detent means connected with the mast member and the tilt frame for releasing the detent means from a normally tightened condition to enable changes in relative angular position of the mast member and the tilt frame about said pivot axis;

said tilt frame comprising a handle strut connected to said main member and extending at an angle divergently therefrom in a direction away from said pivot axis and away from said housing approximately to a plane extending through the more adjacent longitudinal extremity of the heater approximately perpendicularly to the plane of the face of the heater.

4,200,086

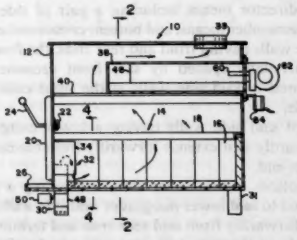
WOOD BURNING STOVE AND FIREPLACE

Robert C. Kolb, Spring City, Pa., assignor to Valley Forge Stove Co., Spring City, Pa.

Filed Mar. 22, 1978, Ser. No. 889,088

Int. Cl.[2] F24B *3/00*

U.S. Cl. 126—66 **22 Claims**



1. A heating apparatus adaptable for use as a convection heater, a hot air heater or a hot water heater for burning wood or the like, comprising: a housing having therein a combustion

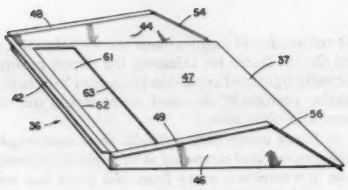
chamber for combustion of wood or similar solid fuel, a flue opening in an upper portion of said housing, a removable insert structure and support means for mounting said removable insert structure inside of said housing above the combustion chamber and below said flue opening, said removable insert being selected to provide a baffle structure, an air-air heat exchanger having a cavity for circulating air to be heated for use outside of said heating apparatus or an air-water heat exchanger having a cavity for circulating water to be heated for further circulation outside of said heating apparatus, an air inlet in the lower part of said housing for supplying air to the combustion chamber, said air inlet being provided with a controllable closure, said controllable closure being controlled in response to the temperature sensed by a sensor.

4,200,087

REMOVABLE FLOW DIRECTOR FOR KITCHEN EXHAUST SYSTEM

Clarke T. Welsh, Logansport, Ind., assignor to Logansport Distributors Inc., Logansport, Ind.

Filed Feb. 10, 1978, Ser. No. 876,743
Int. Cl.[2] F24C *15/20*
U.S. Cl. 126—299 R **29 Claims**



1. In an exhaust system for combustion products from cooking apparatus, wherein the system includes an air supply opening to supply air to an area adjacent the apparatus, and an air exhaust opening to remove air and combustion products from an area adjacent the apparatus, and grease remover means immediately downstream from said exhaust opening in a flow path from said supply opening through said area and said exhaust opening to said grease remover means, the improvement comprising:

flow director means including a pair of side walls, front crossmember means, and bottom crossmember means, said side walls having front and rear ends, the front ends being horizontally spaced by said front crossmember means secured to said side walls at the front ends of said side walls,

each of said side walls having a lower margin extending upwardly as it extends forwardly from the rear end to the front end,

said bottom crossmember means including a bottom wall joined to said lower margins of said side walls and extending forwardly from said rear ends and terminating behind said front crossmember means, thereby leaving an opening in the bottom frontal portion of said flow director means;

said flow director means being removably mounted in the system with said rear ends located at said exhaust opening, and said bottom wall disposed in the path of air supplied through said supply opening, to direct said supplied air forwardly away from said exhaust opening and into said area toward said bottom frontal opening,

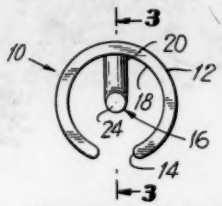
said front crossmember means, side walls and rear ends of said flow director means co-operating with said system to form a duct from said bottom frontal opening to said exhaust opening having a ratio of cross sectional area adjacent said exhaust opening to cross sectional area adjacent said frontal opening of at least 2.

4,200,088

REVERSIBLE VASECTOMY DEVICE AND METHOD

George C. Denniston, Jr., Seattle, Wash., assignor to Ketchum Laboratories Inc., Amityville, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,449
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R **12 Claims**



1. A vasectomy device for blocking the vas deferens and lumen comprising an elongated housing for surrounding and abutting at least a portion of the periphery of said vas deferens to prevent dilation thereof said housing having slot means extending therealong to permit positioning of the housing on the vas, said housing being provided with plug means attached thereto and extending axially along the interior of said housing for blocking sperm flow through said lumen.

4,200,089

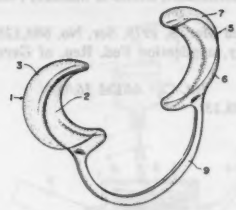
MOUTH CORNER SPREADER

Masaomi Inoue, Tokyo, Japan, assignor to Inoue Attachment Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 895,842
Int. Cl.[2] A61B *1/24*
U.S. Cl. 128—12 **1 Claim**

1. A mouth corner spreader comprising a pair of hooks arranged in opposed relation to each other, designed to fit to the mouth corners, each of said hooks consisting of a substantially C-shaped external portion, a substantially C-shaped internal portion spaced-apart from said external portion, said internal portion being slightly wider than said external portion to extend outwardly beyond the external C-shaped portion, and an arcuate portion which joins said both external and internal portions along the inside edges of the respective C-shaped

portions, and a substantially U-shaped spring arm connected to the lower parts of the external portions of said both hooks and extending downwardly and substantially in the same vertical plane as said external portions of both hooks and positioned



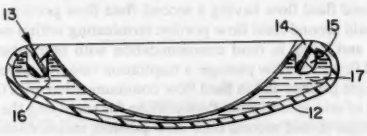
outside the mouth when the hooks are in place, the C-shaped internal portions which extend beyond the C-shaped external portions having a tapered surface flaring away from said external portions and engaging the inside of the mouth adjacent the corners.

4,200,090

VAGINAL CONTRACEPTIVE AND METHOD OF USING

James L. Drobish, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 15, 1979, Ser. No. 3,452
Int. Cl.² A61F 5/46
U.S. Cl. 128—127 **17 Claims**



1. An externally rimless contraceptive device especially adapted for use within the vaginal cavity, comprising:
(a) a front face, said front face constituting a transport surface comprising a semi-permeable membrane, said membrane describing at least a portion of the walls of one or more containers, said containers holding;
(b) a spermicide comprising an aqueous solution of a micelle-forming spermicidal surfactant compound of a concentration at or above the critical micelle concentration of said surfactant compound;
(c) a back affixed to said front face; and
(d) an internal rim, said internal rim comprising a resilient material adjacent to the internal perimeter of said front face.

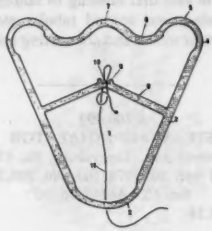
4,200,091

CONTRACEPTIVE INTRAUTERINE DEVICE

Maria L. Del Conte, Scala Campi Elisi, 1, Trieste, Italy

Filed Apr. 17, 1978, Ser. No. 896,702
Claims priority, application Spain, Nov. 23, 1977, 232.273
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 **3 Claims**

1. An intrauterine contraceptive device which is symmetrical on both sides of its longitudinal axis and comprising on one side of said axis:
(1) a base consisting of a small base arc which connects to a straight ascending line inclined at an angle to said base and wherein said line is connected at its topmost extremity to a top portion which is in the form of a half circle disposed in a direction opposite to that of said base arc;
(2) said half circle continuing in the form of an inverted arc which is connected to still another arc to afford the overall shape of an undulating line which terminates at the upper longitudinal axis of said device; and
(3) the straight ascending line also includes a straight branch portion which branches off in an ascending direction toward the longitudinal axis and which, before intersecting said axis, provides a protuberance which occupies the entire cross-section of said portion; including
(4) a descending thread connected to the straight branch portion at about the central part of said device between its protuberances, said thread being passed through a hole in the center of said lower base of said device.

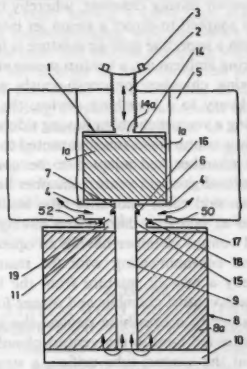


4,200,092

RESPIRATOR HAVING AN OXYGEN-RELEASING CHEMICAL CARTRIDGE

Ernst Warncke, Lübeck, and Adalbert Pasternack, Bad Schwartau, both of Fed. Rep. of Germany, assignors to Dragerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,833
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1977, 2702193
Int. Cl.² A62B 7/00
U.S. Cl. 128—202.26 **16 Claims**



1. A respirator comprising a first cartridge housing having a first end with a first opening therein and a second end with a second opening therein; an oxygen-liberating chemical in said first housing spaced inwardly from each of said ends to form, with said first and second ends, respectively, first and second chambers, said chemical further comprising a gas-permeable barrier separating said first and second chambers; a breathing hose, one end of which is connected to said first opening to permit communication with said first chamber; an auxiliary cartridge housing comprising first and second walls; an oxygen-liberating chemical in said auxiliary cartridge housing spaced from each of said first and second walls and forming,

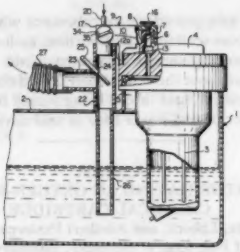
with said first and second walls, respectively, third and fourth chamber, said oxygen-liberating chemical in said auxiliary cartridge housing further comprising a gas-permeable barrier between said third and fourth chambers; an air bag, and releaseable coupling means connecting said auxiliary cartridge housing to said first cartridge housing, said releaseable coupling means comprising first tubular means connecting said second chamber in said first housing to said third chamber in said second housing, and second tubular means concentric with said first tubular means and connecting said air bag to said fourth chamber.

4,200,093

STEAM-AIR INHALATOR

Nat Camp, 912 Sunset Ave., Gettysburg, Pa. 17325

Filed Apr. 20, 1978, Ser. No. 898,101
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—200.14 **4 Claims**



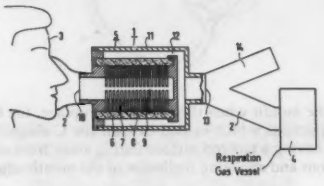
1. In a vaporizer comprising a water reservoir, a steam generating means having a steam outlet nozzle and connected to said reservoir, a steam-air mixing chamber in communication with ambient air, the said outlet nozzle connected to one end of said steam-air mixing chamber, whereby the said steam outlet nozzle is adapted to direct a steam jet into said mixing chamber wherein a superfine mist-air mixture is formed by the steam and entering ambient air, a venturi means at the opposite end of the mixing chamber for continuously aspirating the mixture for delivery to a breathing device, the said venturi means comprising a venturi chamber having side walls and first and second ends, a venturi inlet tube connected to said first end of said venturi chamber and adapted to be connected to a source of pressurized gas, said venturi chamber having a diameter greater than said tube, said inlet tube leading into said venturi chamber at said first thereof and having a discharge orifice, the said venturi chamber having an opening in a side wall thereof and communicating with the steam-air mixing chamber whereby a mist-air mixture from the latter can be aspirated into said venturi chamber and means for conveying the mist-air mixture to a breathing device, the improvement comprising; a threaded bore in the venturi chamber wall at a location adjacent the venturi tube orifice, a stem having an outer threaded portion, an inner unthreaded portion, and an inner end, said stem being threaded through the bore with the inner stem portion extending beyond the venturi chamber wall into the venturi chamber and through a projected flow path of the venturi tube orifice, the said inner end being adjacent the venturi tube orifice, whereby rotational movement of the stem serves to move the inner stem end translationally to cover and uncover at least a substantial portion of the projected flow path from the venturi tube orifice, thereby varying the vacuum produced by the venturi, finger gripping means fastened to the other portion of the stem beyond the venturi chamber for rotating the stem and stop means for limiting the rotation of the stem.

4,200,094

APPARATUS FOR WARMING AND MOISTENING A RESPIRATION GAS

Andras Gedeon, Täby; Sven-Gunnar Olsson, Sollentuna, and Georgios Psaros, Norsborg, all of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 3, 1978, Ser. No. 883,125
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1977, 2715228
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—201.13 **4 Claims**



1. Apparatus for warming and moistening a respiration gas for a patient, comprising a housing having a gas passage therethrough, said gas passage having a first fluid flow portion, one end of said first fluid flow portion including means for direct fluid flow communication with the mouth of the patient to receive exhalation gas flow from the patient when the patient exhales and for supplying a respiration gas to the patient when the patient inhales, the other end of said first fluid flow portion terminating within said housing, said gas passage having a second fluid flow having a second fluid flow portion, one end of said second fluid flow portion terminating within said housing and being in fluid communication with said other end of said first fluid flow passage, a respiration vessel connected with the gas passage and in fluid flow communication with the other end of said second fluid flow portion for supplying the respiration gas to said second fluid flow portion, means communicating with said other end of said second fluid flow portion for directing said exhalation gas flow from said patient to atmosphere, a moisture storage comprising gas-permeable, hygroscopic material in said gas passage, said other end of said first fluid flow portion comprising lamallae (7) disposed thereacross in the direction of flow of the exhalation gas, said lamellae (7) have interspaces in fluid flow communication with the first fluid flow portion at the gas inlet sides thereof, with said moisture storage (6) disposed over the exit sides thereof, whereby when the patient exhales, exhalation gas flows through the first fluid flow portion, the interspaces, the moisture storage, the second fluid flow portion to atmosphere and accumulates heat and moisture in said interspaces and in said moisture storage and when the patient inhales, inhalation gas flows from said respiratory vessel, through the second fluid flow portion, the moisture storage, the interspaces, the first fluid flow portion to the patient and collects the heat and moisture accumulated in the interspaces and moisture storage.

4,200,095

ARRANGEMENT FOR INTRAVENOUS ADMINISTRATION OR THE LIKE

Adrian R. Reti, Cambridge, Mass., assignor to Millipore Corporation, Bedford, Mass.

Filed Aug. 15, 1977, Ser. No. 824,908
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 C **25 Claims**

1. An arrangement for the intravenous administration of liquid comprising:

a liquid passageway means,

a hydrophilic membrane having a bubble point and disposed in said passageway means,

a hydrophilic filter having a pore size finer than that of said membrane and disposed in said passageway means,

in operation said membrane being disposed above said filter, thereby to define an intermediate passageway means section between them,

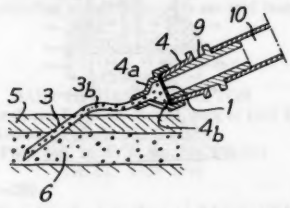
whereby air passage through said membrane when wet is blocked and the replacement of a liquid supply for the administration is facilitated.

4,200,096

DEVICE FOR INTRODUCING A LIQUID OTHER THAN BLOOD IN A BLOOD VESSEL

Guy Charvin, Parc Saint Honore, 06600 Antibes, France

Filed Jun. 8, 1977, Ser. No. 804,765
Claims priority, application France, Jun. 9, 1976, 76 17412
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214.4 **13 Claims**



1. A device for introducing a liquid other than blood into a blood vessel comprising

a hollow tubular needle, said needle being provided with a front open sharp end for insertion into a blood vessel and a rear open end, axially opposite the front sharp end;

a hollow support base being provided with a forward open end connected to the rear end of said needle and a rearward open end defining a cavity therein adapted to receive a device for administering the liquid; and

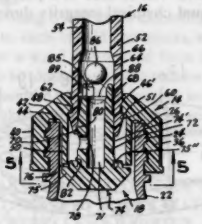
a membrane disposed transversely in said support base across the rear open end of said needle, said membrane having means therein for providing a porosity selectively permeable to air and the liquid to be administered and impermeable to blood.

4,200,097

DISPOSABLE DOUCHE

Thomas G. Hobbs, Jr., and Eugene A. Stephens, both of Lynchburg, Va., assignors to C. B. Fleet Company Incorporated, Lynchburg, Va.

Filed Aug. 4, 1978, Ser. No. 931,241
Int. Cl.[2] A61M 7/02, 1/00
U.S. Cl. 128—251 **19 Claims**



7. A disposable device for dispensing douche liquids and the like contained therein, said disposable device comprising a collapsible container having liquid contents, a nozzle telescopically mounted on said container and having a passageway communicating with the interior of said container for dispensing the liquid contents of said container, a portion of said nozzle being retractable into the interior of said container to a storage position and being extendable to a use position, said nozzle passageway having a length thereof by a cylindrical wall portion in the inner end of the nozzle, a sleeve valve mounted in the inner end of said nozzle for controlling the flow of liquids from said container through said nozzle, said sleeve valve including a cylindrical valve body insertable in said cylindrical wall portion of said passageway and dimensioned to sealingly engage with the cylindrical wall portion, said cylindrical valve body having a flow passageway communicating through one end thereof with the passageway in said nozzle, said valve body having a valve port extending radially therethrough communicating with the valve body flow passageway at the inner end thereof and being selectively communicable with the interior of said container, and an abutment flange on said cylindrical valve body and an abutment on said container including a cylindrical abutment skirt mounted on said container in surrounding relation to a portion of said nozzle extending into said container and engageable with said abutment flange on said cylindrical valve body to move said cylindrical valve body relative to said nozzle and cause said valve port in said cylindrical valve body to communicate the interior of said container with said nozzle when said nozzle is extended to the use position.

4,200,098

OSMOTIC SYSTEM WITH DISTRIBUTION ZONE FOR DISPENSING BENEFICIAL AGENT

Atul D. Ayer, Mountain View, and Felix Theeuwes, Los Altos, both of Calif., assignors to Alza Corporation, Palo Alto, Calif.

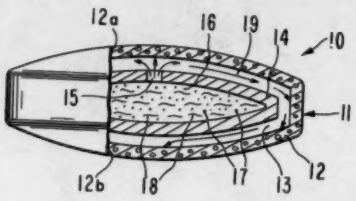
Filed Oct. 23, 1978, Ser. No. 953,906
Int. Cl.[2] A61M 7/00
U.S. Cl. 128—260 **22 Claims**

1. A laminate useful for manufacturing a device for dispensing a beneficial agent to a fluid environment of use, said laminate comprising a first lamina formed of a member selected from the group consisting of cellulose acylate, cellulose diacylate and cellulose triacylate, a third lamina spaced distant from the first lamina, said third lamina formed of a composition comprising a polymer and a pore-former selected from the group consisting of carbohydrates and salts dispersed in the polymer, which polymer is a member selected from the group consisting of cellulose acylate, cellulose discylate and cellulose triacylate, and a second lamina positioned between the first and

third lamina which second lamina is formed of a member selected from the group consisting of essentially salt and carbohydrate soluble in the fluid present in the environment of use.

6. An osmotic system for dispensing a beneficial agent to an environment of use, said system comprising:

(a) a first wall formed a semipermeable material permeable to the passage of fluid present in the environment of use and substantially impermeable to the passage of beneficial agent; a second wall formed of a polymer that maintains its physical and chemical integrity during the dispensing



period and contains a pore forming agent dispersed therein, said second wall spaced distant and around the first wall; and, a layer formed of a compound soluble in fluid that enters the compartment positioned between the first and second walls; said walls surrounding with the first wall facing;

(b) a compartment;

(c) a beneficial agent housed in the compartment; and,

(d) a passageway in the first wall communicating the compartment with the layer.

4,200,099

APPARATUS FOR THE INHALATION OF MEDICINAL AGENTS

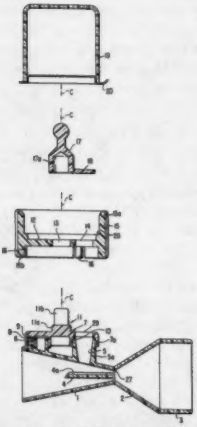
Peter Guenzel; Guenter Rosskamp; Reiner Kolberg, and Hans-Juergen Porep, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Apr. 7, 1978, Ser. No. 895,671

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2716323

Int. Cl.[2] A61M *15/00*

U.S. Cl. 128—266 **6 Claims**



1. In an apparatus for the inhalation of medicinal agents as an aerosol effluent from the apparatus which includes a housing with a venturi tube-shaped interior configuration and with a dispensing aperture opening into the housing in the vicinity of the venturi constriction which is between an air inlet chamber and an exhaust chamber from which the aerosol effluent is inhaled; the provision of a metering mechanism comprising a connector member detachably mounted in fixed position on said housing and having a transfer aperture aligned with the dispensing aperture in said housing; a metering disk rotably mounted on said connector member and including means adapted to support a medicament container and having a central opening and at least one metering chamber therethrough radially outwardly of the said central opening and alignable with said transfer aperture; and composite mounting means detachably connecting said metering disk to said connector member for permissive rotation of the metering disk to selectively align a metering chamber with the aligned transfer and dispensing apertures for discharging a metered dose of medicament into the venturi tube-shaped interior of the housing and for closing the metering chamber against access of additional medicament thereto from the container, said composite mounting means including a pin component extending from said connector member and having an upper portion and a lower circular portion, said central opening being rotatably mounted on said circular portion thereby permitting the rotation of the metering disk and a locking cap component in removable non-rotating engagement with the upper portion of the pin component for securing said metering disk to said connector member, said locking cap component including a lateral extension covering said metering chamber when aligned with said transfer aperture.

4,200,100

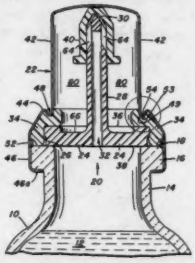
ADDITIVE TRANSFER UNIT WITH PIERCING MEMBER HAVING A PENETRATABLE PROTECTIVE TIP

Wilburn C. Willis, Hagerstown, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 20, 1978, Ser. No. 898,157

Int. Cl.[2] A61J *1/00*

U.S. Cl. 128—272.3 **26 Claims**



1. An additive vial for transferring a liquid medicament into a container comprising:

a liquid storage container for holding the medicament to be transferred, said container having a neck portion terminating at a bead, said bead having a rim, with the inside dimension of the rim defining the circumference of a mouth of the container;

a disc of rigid material closing the mouth of the container, with a peripheral portion of said disc overlying at least a portion of the rim of the container;

a rigid piercing member extending from a central location of the disc in a direction axially outwardly of the mouth of the container, terminating in a needle point;

an aperture extending from the needle point through a longitudinal axis of the piercing member and continuing through the disc along such axis to define a passageway

from the interior of the container to the exterior of the container;

elastic sealing means around and contiguous the outside diameter of the disc overlying at least a portion of the rim of the container, and overlying an outer peripheral portion of the disc;

a protective tip providing a seal over the needle point of the piercing member, said tip being penetrable by the needle point;

a aluminum closure having a removable, outwardly projecting portion extending over and around the piercing member and the protective tip, an annular rim at least partially overlying an outer peripheral portion of the sealing means, and a depending skirt extending downwardly from the annular rim; and

wherein a circular portion of the annular rim overlying the outer portion of the disc is indented into the sealing means toward the disc around the circumference of the rim, constricting the elastic sealing means and the disc toward the rim of the container to maintain a seal about the rim of the container.

4,200,101

CATAMENIAL TAMPON

Jacob A. Glassman, 1680 Meridian Ave., Miami Beach, Fla. 33139

Filed Apr. 11, 1977, Ser. No. 786,290
Int. Cl.[2] A61F *13/20*
U.S. Cl. 128—285 **8 Claims**

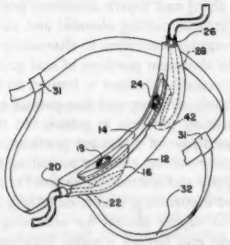
1. A tampon of the character described, comprising a generally cylindrical body made up of highly fluid absorbent material having an insert end and an outer end, a pull string extending from the outer end of said body, and a manipulatable string attached to the body a substantial distance inwardly from the insert end and extending axially beyond the insert end manipulatable for generating an axial recess in the said insert end of the body.

4,200,102

BABY HYGIENIC RECEPTOR

Ernest Duhamel, and Fernando Poirier, both of 1235 Debullion, Apt. 10, Montreal, Canada (H2X-1K9)

Filed Feb. 16, 1978, Ser. No. 878,313
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—286 **2 Claims**



1. A reusable diaper including a generally kidney-shaped body; said body having upper and lower portions with connecting straps adapted to fit around the body of a wearer; an elongated concave cavity along the inside of said kidney-shaped body adapted to contact the perineal regions of a wearer; a first excrement container in said body having inlet and outlet means; a second container spaced from said first container and having inlet and outlet means; each said outlet means being independently connectable to a pump for evacuation and for rinsing,

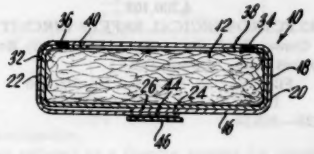
said inlet means being ovate ducts extending from said elongated cavity to each of said containers, said duct for said first container is sized and spaced from said second container so as to be aligned with the rectum of the wearer of the device when the inlet duct for said second container is aligned with the urinary organ of the wearer.

4,200,103

INCREASING ABSORBENT CAPACITY OF SANITARY NAPKIN BY SEALING COVER MATERIAL TO REPELLENT BARRIER

Adam R. Black, Red Bank, N.J., and James J. Timlin, New York, N.Y., assignors to Personal Products Company, Milltown, N.J.

Filed Apr. 28, 1978, Ser. No. 901,178
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—290 W **6 Claims**



1. A sanitary napkin having a body facing side and a garment facing side and comprising:

an elongated, planar absorbent pad;

a generally rectangular menstrual fluid pervious wrapper enveloping said pad, the longitudinal edges of said wrapper extending longitudinally and overlapping on the garment facing side of the napkin;

a generally rectangualr menstrual fluid impervious barrier sheet having longitudinal edges and being sandwiched between said wrapper and said pad, said barrier sheet extending longitudinally with said pad and overlying said garment facing side of said pad, the longitudinal side edges of said pad, and the extreme longitudinal marginal portions of the body facing side; and

at least two menstrual fluid barrier seal lines extending longitudinally with said pad on said body facing side sealing the longitudinal edge portions of said barrier sheet to said wrapper, whereby menstrual fluid is inhibited from transferring from said pad to the area between said wrapper and said barrier sheet.

4,200,104

CONTACT AREA MEASUREMENT APPARATUS FOR USE IN ELECTROSURGERY

Frank W. Harris, Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Nov. 17, 1977, Ser. No. 852,431
Int. Cl.[2] A61B *17/36*; A61N *3/00*
U.S. Cl. 128—303.14 **15 Claims**

1. Patient contact area measurement apparatus for use with an electrosurgical generator comprising

a first electroconductive contact element adapted for contact with a patient;

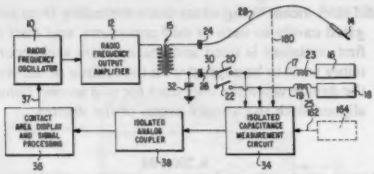
a second electroconductive contact element separated from

said first contact element and also adapted for contact with said patient;

means for directly measuring the capacitance between said first and second electroconductive contact elements to thereby measure the area of contact of said patient with respect to said contact elements;

an electrosurgical generator;

an active electrode connected to said generator;


RADIO FREQUENCY OSCILLATOR
RADIO FREQUENCY OUTPUT AMPLIFIER
CONTACT AREA DISPLAY AND SIGNAL PROCESSING
ISOLATED ANALOG COUPLER
ISOLATED CAPACITANCE MEASUREMENT CIRCUIT

a split patient electrode connected to said generator, said split electrode comprising said first and second electroconductive contact elements; and

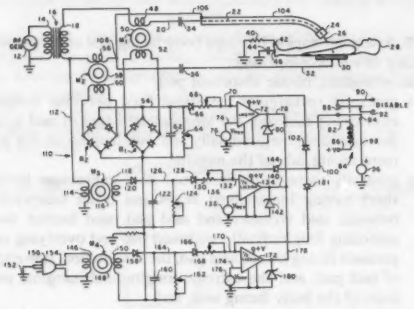
said capacitance measuring means including means for detecting whether the measured contact area of said patient with respect to said split electrode exceeds a predetermined value corresponding to safe operation of the electrosurgical generator.

4,200,105

ELECTROSURGICAL SAFETY CIRCUIT

Donald I. Gonser, York, Pa., assignor to Dentsply Research & Development Corp., Milford, Del.

Filed May 26, 1978, Ser. No. 909,866
Int. Cl.[2] A61B *17/36*; A61N *3/02*
U.S. Cl. 128—303.14 **2 Claims**



1. In an electrosurgical device used in an environment having a system ground and having a radio-frequency generator coupled to chassis ground, an active electrode for performing electrosurgery on a patient, an active lead connecting the radio-frequency generator to the active electrode for carrying current from the radio-frequency generator to the active electrode, a dispersive electrode for receiving current which passes from the active lead and through the patient, and a return lead connecting the dispersive electrode to the radio-frequency generator for carrying current from the dispersive electrode back to the radio-frequency generator, an electrosurgical safety circuit, comprising:

a first monitor means for sensing the flow of current in the active lead;

a second monitor means for sensing the flow of current in the return lead;

means responsive to said first monitor means sensing a predetermined greater level of current than said second monitor means for actuating an alarm;

a first low impedance alternate current path coupled between chassis ground and the return lead so as to hold the dispersive electrode near ground potential and to provide a current path from chassis ground to the radio-frequency generator;

a third monitor means for sensing a predetermined current flow in said first alternate current path and for actuating an alarm;

a second alternate current path coupled between system ground and chassis ground so as to establish a return path from system ground to the radio-frequency generator via the first and second alternate current paths; and

a fourth monitor means for sensing a predetermined current flow in said second alternate current path and for actuating an alarm,

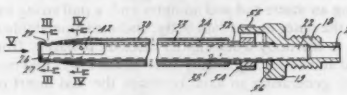
whereby radio-frequency current flowing from the patient to a ground results in an alarm generated by said first and second monitor means by virtue of a greater level of current flowing in the active lead than in the return lead irrespective of the operability of said third or fourth monitor means, said first alternate path holds the dispersive electrode near ground potential to prevent the dispersive electrode from floating to a hazardous potential, said third monitor means causes an alarm to be actuated irrespective of the operability of said first, second or fourth monitor means when current flows between chassis ground and the return lead, and said fourth monitor means causes an alarm to be activated irrespective of the operability of said first, second or third monitor means when current flows to system ground.

4,200,106

FIXED ARC CYCLIC OPHTHALMIC SURGICAL INSTRUMENT

Nicholas G. Douvas, 4200 N. Gratiot, Port Huron, Mich. 48060, and Henry T. Dinkelkamp, 200 W. Orchard Pl., Mt. Prospect, Ill. 60056

Filed Oct. 11, 1977, Ser. No. 841,109
Int. Cl.[2] A61B *17/32*
U.S. Cl. 128—305 **3 Claims**

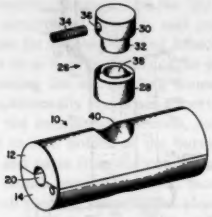


2. In combination with an opthalmic surgical instrument incorporating a tubular stationary cutting element having a closed distal end and a laterally directed orifice therein proximate to but spaced from its distal end and defining a cutting edge, a rotatable cutting element interfitted with the stationary cutting element and coacting with said cutting edge to shear material which penetrates the orifice, a pair of angularly spaced abutment portions fixed with respect to said stationary cutting element, third and fourth abutment portions fast with respect to the rotatable cutting element and alternately rotatable in opposite angular directions to alternately engage and to be arrested by the abutment portions of said pair, whereby the rotation of said rotatable element is limited to less than 360°, means for alternately driving said last-named element to and away from a shearing position in which the third abutment engages one of said pair of abutment portions, the means for driving the rotatable cutting element including a D.C. electric motor, power supply and controlling means for the motor, said power supply and controlling means including a square wave alternating current supply circuit for actuating the motor in opposite directions and having a pulse duration shorter than the time required for said abutments to move from one extreme relative position to the other.

4,200,107
VASCULAR CONNECTOR FOR EFFECTING VASCULAR DUCT CLOSURE AND PERMITTING VASCULAR RE-OPENING

Robert L. Reid, 7450 E. Bonita Dr., Scottsdale, Ariz. 85253

Filed Nov. 16, 1977, Ser. No. 851,858
Int. Cl.[2] A61B 17/00, 17/12
U.S. Cl. 128—305 12 Claims



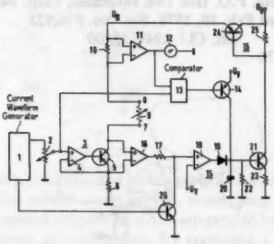
1. A method for effecting vascular duct closures comprising the steps of:

closing a vascular connector around a portion of a vascular duct, and actuating a guillotine type plunger assembly within the vascular connector to both cut off a portion of the portion of a vascular duct and block off and hold connected the severed ends of the vascular duct portion, wherein said guillotine type plunger assembly comprising a piston type member having an extension member connected to one end of said piston type member, said piston type member having an opening extending therethrough in the same direction as said channel means, a hollow fibrous member located in said opening, and a hollow short tubular portion.

4,200,108
ELECTROMEDICAL APPARATUS

Kurt Weigert, Nuremberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 953,366
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1977, 2749792
Int. Cl.[2] A61N 1/36
U.S. Cl. 128—419 R 10 Claims

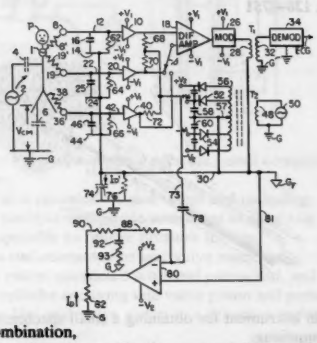


1. Electromedical apparatus, particularly a stimulation current apparatus, comprising a current waveform generator as well as a constant current stage for controlling the output current through a load resistance, preferably the human body of the patient, which operates with a specifiable operating voltage, characterized in an operating voltage control circuit (15), the constant current stage (3) and operating voltage supply (U_0) being connected to said operating voltage control circuit (15), said control circuit (15) being operable to adjust the operating voltage (U_B) from an initial voltage value at an initial intensity to higher values with an increasing load resistance, said control circuit (15) having a control time constant of such a value relative to the differential resistance change of the load resistance, that, in the case of a differential resistance change exceeding a specifiable threshold, the change of the operating voltage proceeds less rapidly than the resistance change, as a consequence of which the control circuit is switched to a lower operating voltage value.

4,200,109
COUPLING CIRCUIT WITH DRIVEN GUARD

Richard H. McMorrow, Jr., Lincoln, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 7, 1978, Ser. No. 940,405
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—696 2 Claims



1. In combination,

a circuit referred to a floating ground for coupling electrodes to equipment that is referred to true ground,

an operational amplifier having an inverting input, a non-inverting input and an output,

a capacitor coupled between a point on said circuit and said inverting input,

means coupling said non-inverting input to a point of floating ground potential,

an impedance connected between said output of said amplifier and true ground, and

means for supplying operating potentials to said operational amplifier that are referred to floating ground.

4,200,110
FIBER OPTIC PH PROBE

John I. Peterson, Falls Church, Va., and Seth R. Goldstein, Bethesda, Md., assignors to United States of America, Washington, D.C.

Filed Nov. 28, 1977, Ser. No. 855,384
Int. Cl.[2] A61B 5/00; G01N 21/00
U.S. Cl. 128—634 8 Claims

1. A fiber optic pH probe suitable to be implanted in tissue for physiological studies, comprising: an ion permeable mem-

brane in the form of a hollow, elongated cylinder having a distal end and a proximal end, said membrane being sealed at the distal end thereof; a pair of optical fibers having distal and proximal ends located substantially parallel to each other and adjacent to each other at their distal ends, said fiber distal ends being located within the proximal end of said hollow membrane; pH sensitive color-changing dye-containing solid material located within said hollow membrane, said ion permeable membrane having pores of a size large enough to allow passage of hydrogen ions while being sufficiently small so as to preclude passage of the dye-containing material.

4,200,111

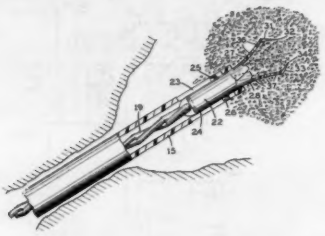
SPECIMEN REMOVAL INSTRUMENT

Arthur M. Harris, 3349 W. Park Rd., Hollywood, Fla. 33021

Filed Sep. 21, 1978, Ser. No. 944,604

Int. Cl.[2] A61B *10/00*

U.S. Cl. 128—751 **8 Claims**



1. In an instrument for obtaining a small specimen from the lungs comprising:

an elongated flexible tube;

a flexible push-pull element extending slidably through the tube;

a head operatively connected to the inner end of said push-pull element and slidable in the inner end of the tube between a retracted position and an extended position;

and opposed jaws operatively connected to said head at its inner end, said jaws being resiliently biased apart to project laterally beyond the tube at its inner end when said head is pushed to its extended position by said push-pull element, said jaws being movable laterally toward each other and slidable into the tube;

the improvement wherein:

said jaws have respective cutting edges which approach each other and sever a specimen from the lungs as said tube is advanced toward the jaws:

and said jaws define a recess between them for holding the severed specimen;

and further comprising

means acting between said head and said tube for guiding the head lengthwise along the tube;

said last mentioned means comprising longitudinal slots at diametrically opposed locations in the tube, and lateral projections carried by the head and slidably received respectively in said slots.

4,200,112

DEVICE FOR MEASURING THE FORCE OF A URINE DISCHARGE

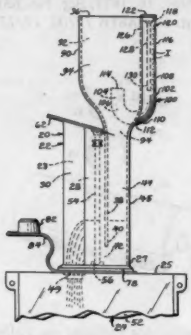
Daniel M. McWhorter, Lake Bluff, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jul. 12, 1978, Ser. No. 923,860

Int. Cl.[2] G01F *1/00, 23/00*

U.S. Cl. 128—761 **10 Claims**

1. A device for measuring a urine discharge, comprising: a hollow receptacle having an inlet port adjacent an upper end of the receptacle to receive the urine discharge and channel means below the inlet port to receive the discharge passing through the port, a U-shaped tube defining a lumen and having first and second upright arms, said first arm being shorter in length than the second arm and defining an opening facing toward said port such that a portion of said discharge passes



into the tube opening and lumen to provide an indication of the discharge force in the second arm associated with the height of urine attained in the lumen of the second arm, and vent means disposed in said second arm for venting the upper portion of said second arm.

4,200,113

LIPID REMOVAL FROM TOBACCO

Otto K. Schmidt, South Windsor, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 588,272, Jul. 19, 1975, abandoned. This application May 11, 1977, Ser. No. 795,989

Int. Cl.[2] A24B *15/04, 15/08*

U.S. Cl. 131—17 **11 Claims**

1. A process of preparing smoking compositions to remove lipid therefrom comprising contacting said tobacco with alkaline water and a water-soluble organic solvent, the total amount of water present being at least 15 percent by volume and thereafter forming the extracted tobacco into a smoking composition without restoring lipids thereto.

4,200,114

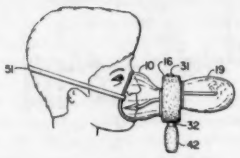
SMOKING APPLIANCE

Howard W. Waite, P.O. Box 144, Inverness, Calif. 94937

Filed Feb. 10, 1978, Ser. No. 876,923

Int. Cl.[2] A24F *13/00*

U.S. Cl. 131—178 **6 Claims**



1. A smoking device comprising a face piece formed and qasketed in a manner to make an airtight seal between the atmosphere and the nose and mouth of the user, the face piece fitted by means of standardized circular matching openings to an intermediate section, a partition in the intermediate section, the intermediate section containing an inwardly directed first check valve on the face piece side of the intermediate section for the entrance of air inhaled through the nose of the user, said partition containing a second check valve directing air exhaled

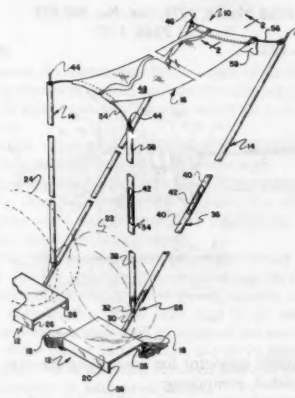
from the user into a combustion chamber fitted by matching circular openings to the intermediate section on a side thereof opposite from said face piece, said combustion chamber adapted to contain burning tobacco or the like, an outwardly directed third check valve in the combustion chamber side of said partition, a cartridge of smoke and odor absorbing material positioned at the discharge side of the outwardly directed third check valve to filter all exhaled air, smoke, and other gases from combustion of tobacco or the like before entering the surrounding atmosphere, wherein said combustion chamber includes means for holding burning tobacco or the like in a closed chamber so as to prevent any of the products of combustion from entering the surrounding atmosphere, and said smoking device additionally comprises a fourth check valve in the partition of the intermediate section, said fourth check valve connected to said holder of the burning material and directing smoke and gases from the combustion chamber to a small plenum, a mouth piece within said face piece and connected to the small plenum, whereby the plenum may be connected to the mouth of the user, a fifth check valve in said partition communicating between the mouth piece and the combustion chamber for carrying gases through the partition from the mouth piece whereby the user may exhale through the mouth piece into the combustion chamber and out said third check valve.

4,200,115

AWNING

George Parker, 3105 Brawner Pkwy., Corpus Christi, Tex. 78415

Filed Aug. 4, 1978, Ser. No. 931,289
Int. Cl.[2] A45F *1/14*
U.S. Cl. 135—5 A 16 Claims



1. A readily erectable and disassemblable awning of the type using a motor vehicle as an anchor, comprising

a pair of spaced support members adapted to be placed on an underlying ground surface for receiving a wheel of the motor vehicle thereby anchoring the support members, each support member including first support means comprising support protuberances having an upwardly diverging fork providing first and second connectors;

a pair of spaced generally vertically extending supports each comprising first and second elongate members having a first end providing second support means removably connectable with the first and second connectors and a second end; and

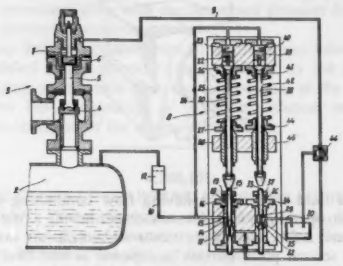
a canopy and means for connecting the canopy to the support adjacent the second ends thereof.

4,200,116

DEVICE FOR SENSING PRESSURE AND GOVERNING THE OPERATION OF SAFETY VALVES

Francois Gemignani, 14 Lotissement du Pati, Martigues, Bouches-du-Rhone, France

Filed Apr. 20, 1977, Ser. No. 789,229
Claims priority, application France, Apr. 22, 1976, 76 12833
Int. Cl.[2] F16K *31/122*
U.S. Cl. 137—492 5 Claims



1. A safety valve system for a pressure vessel comprising in combination:

a safety valve mounted on said vessel and including:

a valve member engageable with a seat to close said vessel and openable to relieve pressure therein,

a piston rod connected to said valve member,

a valve piston connected with said piston rod, and

a main cylinder receiving said valve piston and pressurizable to bias said valve piston in a direction maintaining said vessel closed;

a pressure-sensing and valve controlling device spaced from said safety valve and from said vessel, said device comprising:

a control-valve body spaced from said vessel and from said safety valve,

a first chamber formed in said body and connectible to said vessel and to said main cylinder, said first chamber being provided with a first control valve adapted to close communication between said first chamber and said main cylinder,

a second chamber formed in said body, connected to the atmosphere and to both said first chamber and said main cylinder at a connection in said body, said second chamber being provided with a second control valve adapted to close communication between said first chamber and main cylinder on the one hand and the atmosphere on the other hand,

respective control rods positioned to act upon said control valves,

respective control pistons operatively connected to said control valves,

respective control cylinders receiving said control pistons and connectible to said vessel for pressurization thereby to bias said control piston in directions in which said control pistons maintain said first control valve closed and open said second control valve, and

respective springs acting upon said control rods so that below a given pressure value in said vessel said first control valve is open to connect said first chamber to said main cylinder while said second control valve is closed and above a given pressure value in said vessel said first control valve is closed while said control valve is opened to vent said main cylinder to the atmosphere through said second chamber; and respective conduits connecting:

said main cylinder to said chambers at said connection,

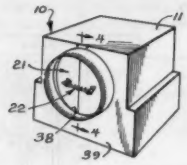
said control cylinders to said vessel, and

said vessel to said first chamber.

4,200,117
DAMPER MECHANISM FOR FRESH AIR INTAKE

Richard M. Anderson, Nashville, and Richard F. Beehler, Franklin, both of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Jul. 3, 1978, Ser. No. 921,841
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—512.1 7 Claims



1. In a fluid flow device having flow conducting means defining an opening, a first closure member having a first pivot portion, and a first seating portion, a second closure member having a second pivot portion juxtaposed to said first pivot portion, and a second, seating portion, and pivot means for mounting said pivot portions for pivoting about an axis extending across said opening between a closed position wherein the closure members extend substantially from said pivot axis across the opening with said seating portions juxtaposed to the opening, thereby effectively closing said opening, and a fully opened position wherein the closure members extend back substantially from said pivot axis in a folded arrangement extending downstream relative to said opening, improved means for controlling the movement of said closure member comprising:

a biasing coil spring having opposite ends and a mid-portion intermediate said ends;

first spring connecting means on said first closure member; and

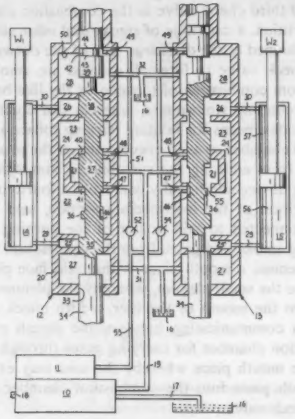
second spring connecting means on said second closure member, said opposite ends of said spring being connected respectively to said connecting means with said spring being spaced in an upstream direction from the closure members when the closure members are in said closed position and with said midportion engaging said pivot portions when the closure members are pivoted back from said closed position to and beyond a preselected intermediate position intermediate said closed and fully opened positions wherein said connecting means and said pivot means are in an aligned disposition, said spring being resiliently stretched by backward movement of the closure members from said closed position to said intermediate position and folded about its midportion adjacent said pivot means substantially free of further stretching by a backward movement of the closure members beyond said intermediate position toward said fully opened position causing said connecting means to move to substantially rearwardly of said aligned disposition thereof.

4,200,118
LOAD RESPONSIVE CONTROL VALVE

Tadeusz Budzich, 80 Murwood Dr., Moreland Hills, Ohio 44022

Filed Nov. 13, 1978, Ser. No. 960,072
Int. Cl.[2] F15B *13/08*
U.S. Cl. 137—596.13 5 Claims

1. A load responsive valve assembly comprising at least one valve housing having an inlet chamber, first and second load chambers, at least one exhaust chamber, and load sensing port means operable through signal conducting passage means to transmit a control load pressure signal to output flow control means of a pump, direction control means for selectively interconnecting and isolating said chambers and said load sensing port means in a number of control positions including a neutral position and a regeneration position, in said regeneration position said direction control means having means for interconnecting said first and second load chambers, means for interconnecting said first and second load chambers with said load

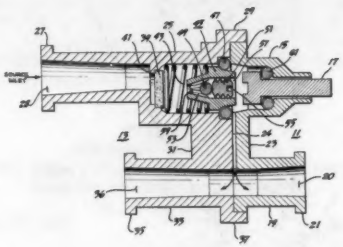


sensing port means, and means for interconnecting said first and second load chambers with said inlet chamber through metering orifice means.

4,200,119
ADJUSTABLE FLUID FLOW RESTRICTOR

Patrick J. Cunningham, 600 N. Ladera Vista, Fullerton, Calif. 92631

Filed May 8, 1978, Ser. No. 903,955
Int. Cl.[2] F16K *1/52*
U.S. Cl. 137—605 10 Claims



1. An adjustable restrictor for controlling the rate of fluid flow into a conduit, comprising:

a body member having a section of conduit defining a continuous unrestricted fluid path within the walls and ends thereof, said body member having a control chamber adapted to receive a fluid flow restrictor said body member having a fluid passage connected between said control chamber and said section of conduit, said body member having an inlet port connected to said control chamber and adapted to be connected to a source of fluid to be controllably dispensed into said section of conduit; and

a fluid flow restrictor positioned in said control chamber between said inlet port and said fluid passage for restricting the flow of fluid between said inlet port and said fluid passage, said fluid flow restrictor having a central opening therethrough, said central opening having a cylinder section and a truncated cone section, said cylinder section being connected to the base of said truncated cone section, said cylinder section having a threaded set-screw engaged

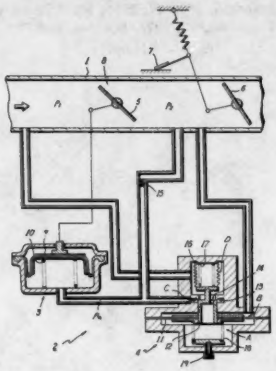
therein whereby fluid may traverse the spiral grooves between said threads of said set-screw and the walls of said cylinder section, said set-screw being rotated into said cylinder section to encounter the walls of said truncated cone section thereby obstructing the openings into said spiral grooves between said threads and said walls of said cylinder section and restricting the rate of fluid flow through said spiral grooves.

4,200,120

AREA TYPE FLOW RATE MEASURING DEVICE

Kei Kimata, Aichi, and Tsugito Nakazeki, Iwata, both of Japan, assignors to NTN Toyo Bearing Company Limited, Osaka, Japan

Filed Apr. 11, 1978, Ser. No. 895,378
Int. Cl.[2] F16K *31/00*; F02M *69/00*
U.S. Cl. 137—613 **6 Claims**



1. A device for measuring the flow rate of air drawn into an internal combustion engine, said device comprising:

(a) an air intake conduit through which air is drawn into the engine;

(b) throttle valve means positioned in the conduit for controlling the flow rate of air therethrough;

(c) a sensor valve means positioned in the conduit upstream of the throttle valve means whereby the opening of the throttle valve means produces a difference in pressure across the sensor valve means;

(d) servo means operable to adjust the sensor valve means such that the pressure differential across the throttle valve means and the sensor valve means remains constant such that the measure of the flow rate of air past the sensor valve means is measured in terms of the area of the opening of the sensor valve means, the servo means including:

a control valve disposed between first and second control chambers in said servo means,

a first passage means extending from the conduit upstream of the sensor valve means to the first control chamber and a second passage means extending from said second control chamber to a sensor valve control means,

a variable flow orifice means between said first and second control chambers wherein the variable flow orifice means varies its opening area in response to any variation of the control valve, thereby varying the pressure in the second control chamber,

said sensor valve control means being responsive to the pressure in said second control chamber and including means coupled to the sensor valve means for varying the sensor valve means as a function of the air pressure in the second control chamber; and a third passage means extending from between said sensor valve means and said throttle valve means and extending to said servo means, said control valve including means responsive to pressure in said third passage means to vary its opening

(e) a pressure amplifying means including:

a bypass passage means connected between the upstream and downstream portions of the conduit across the sensor valve means,

pressure decreasing means connected in the bypass pipeline for decreasing the pressure of air flowing therethrough, and a fourth passage means from said bypass passage means to said second control chamber and in communication with the decreased pressure from said pressure decreasing means

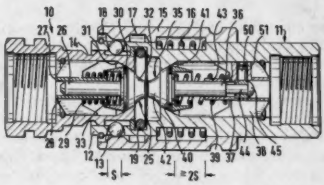
whereby the pressure difference across the sensor valve means is amplified in the second control chamber by the pressure amplifying means such that the air pressure in the control chamber has a magnitude of variation sufficient to ensure reliable operation of the sensor valve means.

4,200,121

QUICK-CLOSURE COUPLING FOR HYDRAULIC LINES

Friedrich C. Walter, Karlsruhe, and Ludwig Portele, Ettlingen, both of Fed. Rep. of Germany, assignors to Argus Gesellschaft mbH, Ettlingen, Fed. Rep. of Germany

Filed Feb. 6, 1978, Ser. No. 875,555
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712117; Apr. 6, 1977, 2715417
Int. Cl.[2] F16L *29/00, 37/28*
U.S. Cl. 137—614.05 **6 Claims**



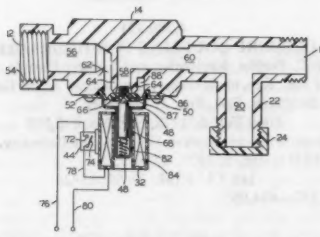
1. A quick-closure coupling for hydraulic lines, comprising: two insertable coupling halves, lockable in a coupling position, said coupling halves comprising a plug valve and a sleeve valve each having a closure piece; closure springs for spring loading said closure pieces in closure direction; said closure pieces being held in closed position when said coupling halves are separated; said plug valve of said coupling halves having a first stop restricting and defining a first displacement travel of said closure piece in opening position; said sleeve valve having the closure piece spring-loaded with a stronger spring and having a second stop restricting and defining a second displacement travel equal to twice said first displacement travel of said plug valve closure piece said sleeve valve having locking means capable of locking after axial displacement of one of said closure pieces beyond the first displacement travel and after locking the sleeve valve closure piece returns to its opening position corresponding to said first displacement travel, said locking means reaching a stop position locking said sleeve valve closure piece in said opening position, said locking means moving back during disconnection of said coupling halves to its release position permitting said sleeve valve closure piece to move a distance equal to twice said first displacement travel; said plug valve comprising a plug connected to a pressure source and said sleeve valve connected to a hydraulic device, said closure pieces comprising spring-biased poppet type non-return valves; said poppet valves biasing each other into an open position by moving a predetermined distance upon connection of the coupling halves, the opening travel of the poppet valve in said plug half being limited by said first stop at the open position and the poppet valve of said socket half being capable of moving a distance equal to said second displacement

travel for permitting connection of said two coupling halves with pressure remaining in the hydraulic device, the poppet valve of said plug half being held in a closed position by said pressure source while the two coupling halves are being connected so that the poppet valve of the socket half is biased a distance equal to said second displacement travel to said open position.

4,200,122
THERMOSTAT CONTROL SOLENOID FOR LAWN WATERING

David M. Miskin, 8 Still La., West Hartford, Conn. 06117

Filed Sep. 7, 1978, Ser. No. 940,214
Int. Cl.[2] F16K *31/06*
U.S. Cl. 137—624.13 **8 Claims**

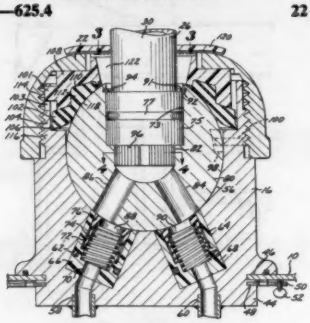


1. An automatically operated control valve comprising:
a. a valve body including an inlet, an outlet and a flow passage providing fluid communication between said inlet and said outlet;
b. a valve operating member movably supported in said flow passage of said valve body for movement between an open position in which fluid is permitted to flow from said inlet to said outlet and a closed position in which fluid is prevented from flowing from said inlet to said outlet;
c. solenoid means mounted on said valve body and including:
(i) armature means movable between a first position and a second position and operatively connected to said valve operating member for movement of said valve operating member between its closed and open positions when said armature means is operated between its first and second positions, respectively, said armature means being biased to said first position; and
(ii) coil means adjacent said armature means and operable, upon current flowing therethrough in response to a potential difference applied thereacross, to produce a magnetic field, said armature means being maintained in its second position by said magnetic field when a rated current flows through said coil, said valve operating member thereby being maintained in said open position when said rated current flows through said coil means and being maintained in said closed position when no current flows through said coil means, said coil means being arranged to burn out when current sufficient to maintain said armature means in said second position has flowed through said coil means for at most a prohibited "on" duration and thereby prevent flow of fluid through said flow passage for a length of time greater than said prohibited "on" duration;
d. electric circuit means adapted for application of a potential difference thereacross and electrically connected to said coil means for application of the potential difference across said coil means sufficient to cause the rated current to flow through said coil means; and
e. thermostat means electrically interposed in said circuit means to permit the application to said coil of potential difference applied across said circuit means when the temperature of said thermostat means is less than a predetermined minimum "off" temperature and to prevent the application across said coil means of potential difference applied across said circuit means when the temperature of said thermostat means exceeds a predetermined maximum "on" temperature, said coil means being arranged in thermal communication with said thermostat means, the flow of current through said coil generating heat transferred to said thermostat means until it reaches a temperature that exceeds the maximum "on" temperature and said thermostat opens to prevent the application of said potential difference across said coil means, said thermostat means, upon cooling below said minimum "on" temperature when no current is flowing through said coil, closing to permit application of the potential difference across said coil means.

4,200,123
BALL-TYPE FAUCET

Anthony R. Brandelli, 2418 W. 256th St., Lomita, Calif. 90717

Filed Oct. 10, 1978, Ser. No. 949,741
Int. Cl.[2] F16K *11/087*
U.S. Cl. 137—625.4 **22 Claims**



1. In a faucet for the dispensing of a single stream of controllable proportions of at least two fluid streams and having a body with a hemispherical cavity receiving a spherical valve member having a single outlet port and inlet port means communicating therewith and sealingly secured in said cavity by an annular seal and annular cover member assembly removeably attached to said body, at least two inlet ports communicating with said cavity through seal wells and annular seal means received in each of said seal wells and biased therein against the opposed surface of said spherical valve member; the improvement which comprises:
a single member secured to and received in the single outlet port of said spherical valve member and projecting through said annular seal and annular cover member, said single member being tubular to function as the dispensing nozzle and as the valve member operator of said faucet.

4,200,124
VALVE ASSEMBLY

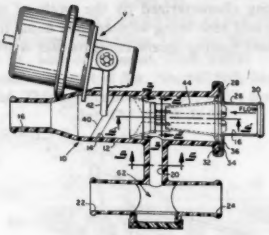
Eugene Stratynski, West Chicago, and Keith Zukausky, St. Charles, both of Ill., assignors to Eaton Corporation, Cleveland, Ohio

Filed Feb. 21, 1978, Ser. No. 879,836
Int. Cl.[2] F16K *11/00*
U.S. Cl. 137—885 **9 Claims**

1. A valve assembly of the type capable of directing bypass flow through a branch channel, said assembly comprising;
A. housing means defining
(i) a main fluid passage with an inlet port and an outlet port communicating with said passage,
(ii) a bypass channel branching from said main passage at a flow station intermediate said inlet and outlet ports;

B. movable valve means disposed in said main passage downstream of said bypass channel, said valve means being movable between a first position preventing flow to said outlet port and a second position permitting flow to said outlet port, wherein said housing means defines a substantially straight cylindrical region between said inlet and said valve member; and

C. venturi means comprising a single integral member having a converging primary inlet and a secondary port located at the throat of said venturi and a diverging outlet, said venturi means being disposed in said straight cylindrical region upstream of said valve means with the converging primary inlet thereof disposed to receive all flow from



the said inlet port and the secondary port thereof disposed adjacent said bypass channel station, wherein said diverging outlet of said venturi is disposed adjacent said valve means such that flow therefrom is not permitted to flow to said bypass channel, said venturi means being operative upon said valve means being in the flow-preventing position to direct flow outwardly through said secondary port to said bypass channel and operative upon said valve means being in the fully open position to substantially prevent flow to said bypass channel, said venturi means being operative with said valve means in the intermediate position to continuously divert a portion of the flow through said main passage to said bypass channel.

4,200,125

TUBULAR ARTICLE

James M. Hush, Evergreen, and Donald J. McPhee, Littleton, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 779,213, Mar. 18, 1977, Pat. No. 4,104,098. This application Apr. 10, 1978, Ser. No. 894,781
Int. Cl.[2] F16L *11/00*; C09J *5/02*
U.S. Cl. 138—126 15 Claims

1. A partially cured flexible hose core comprising:

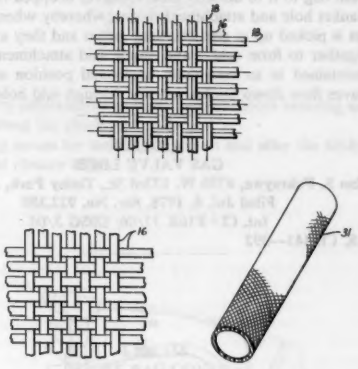
a curable rubber-like seamless tubular core having (a) an inner portion constituting at least the volumetric majority of the core member, which is substantially fully cured and resilient, and (b) an outer tacky surface which is uncured to a depth at least just beneath the surface of the core.

4,200,126

PLASTIC COMPOSITE TUBULAR ELEMENT CONTAINING A SLEEVE OF BRAIDED METALLIC RIBBONS

Elson B. Fish, Lakeville, Ind., assignor to Plas/Steel Products, Inc., Walkerton, Ind.

Filed Aug. 7, 1978, Ser. No. 931,450
Int. Cl.[2] F16L *9/16*
U.S. Cl. 138—143 5 Claims



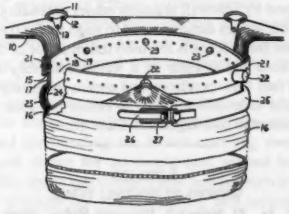
1. A rigid plastic composite tube comprising a first sleeve of helically braided metallic ribbons in which ribbons extend in helically opposite directions in woven relationship under and over each other in metal-to-metal contact, a second sleeve engaged with said first sleeve, said second sleeve being of helically braided fibrous strands in which strands extend in helically opposite directions in woven relationship, and hardened resin material in which said first and second sleeves are embedded and held in a unitary composite rigid tubular structure; said first and second sleeves in combination retaining said resin in said first sleeve, said second sleeve and said resin reinforcing said first sleeve, whereby said first sleeve is retained in its tubular shape as a part of the composite structure.

4,200,127

LEAF BAGGING EQUIPMENT AND METHOD

Daniel W. Dunleavy, 1315 N. Line St., Lansdale, Pa. 19446

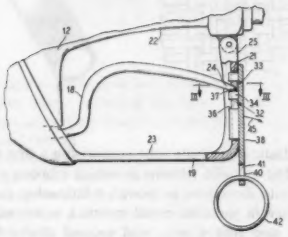
Continuation-in-part of Ser. No. 766,714, Feb. 8, 1977, abandoned. This application May 26, 1978, Ser. No. 910,076
Int. Cl.[2] B65B *1/06*
U.S. Cl. 141—10 8 Claims



1. Leaf bagging equipment comprising a blanket which is of sheet form and is free and of unshaped contour around its peripheral edge, the peripheral edge being unsupported and

including spaced handling means, and thereby is adapted to be spread out to lie flat on the ground or to be picked up at its periphery by said handling means and be brought together to form a funnel shape, the leaves being collectable on the blanket directly as a pick up sheet when it is spread out, said blanket having a centrally located hole through it, to which and through which the leaves are delivered when the periphery of the blanket is picked up and gathered together to form a funnel shape, an attachment means around the hole to hold it open and to which the blanket is secured, and said attachment means also including means for temporarily attaching a removable trash bag to it to directly receive leaves dropped through the blanket hole and attachment means, whereby when said blanket is picked up at said handling means and they are brought together to form said funnel shape said attachment means is maintained in an essentially horizontal position so that the leaves flow down unobstructedly through said hole.

4,200,128
GAS VALVE LOCK
Alan S. Pokrzywa, 6750 W. 173rd St., Tinley Park, Ill. 60477
Filed Jul. 6, 1978, Ser. No. 922,350
Int. Cl.[2] F16K *35/06*; G05G *5/06*
U.S. Cl. 141—392 **5 Claims**



1. A fuel valve hold open lock for use in association with trigger controlled fuel delivery valve assemblies equipped with trigger guards having slots therethrough adjacent a free end of a trigger comprising: a freely removable substantially U-shaped cross section elongated member having opposed spaced sidewalls interconnected by and projecting from a bight base, the sidewalls having a longitudinal length, the base having a longitudinal length greater than the length of the sidewalls and extending beyond longitudinal ends of the sidewalls, the sidewalls being dimensioned to have longitudinal lengths approximately equal to the longitudinal length of the trigger guard slots of standard fuel delivery valve assemblies, the sidewalls being spaced from one another so as to have an overall width substantially equal to the width of standard trigger guard slots, the sidewalls are insertable into said standard trigger guard slot, the sidewalls being segmented forming longitudinally spaced gaps, the gaps providing projecting ledges formed by sidewall segment edges extending away from said bight, the ledges dimensioned to engage the free end of the trigger when the sidewalls are inserted in a slot of the standard trigger to hold the trigger of a valve assembly at one of a plurality of fuel flow positions and means including the dimensioning of the sidewalls tending to retain the lock in the slots against accidential dislodgement there from.

4,200,129
WOOD TURNING TOOL
John Sneed, Jr., 21 Norwich, Pleasant Ridge, Mich. 48069
Filed Mar. 30, 1978, Ser. No. 891,681
Int. Cl.[2] B23B *27/00*
U.S. Cl. 142—56 **15 Claims**

1. A hand-held tool for turning a workpiece in a lathe having associated therewith a platform positioned below said workpiece, comprising:

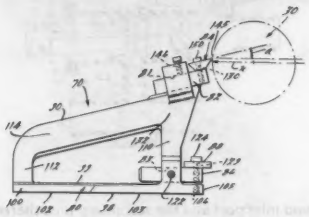
a base member defining the front, rear, and sides of said tool;

a handle located above said base member spaced approximately equidistant from the sides of the tool and extending substantially the length of said tool from the front to the rear thereof;

a front support member projecting upwardly from said base at a point approximately equidistant from the sides of said tool fixedly secured to and supporting said handle; and

cutting means including a cutting element secured to and removable from said front support member, whereby said cutting element will contact said workpiece when the tool is moved along said platform;

said tool being characterized by the angle of said handle relative to said base being substantially equal to the angle at which said cutting means contacts said workpiece.



4. A hand-held tool for turning a workpiece in a lathe having associated therewith a platform positioned below said workpiece, comprising:

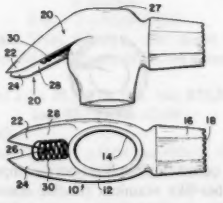
a base member defining the front, rear, and sides of said tool;

a handle located above said base member spaced approximately equidistantly from the sides of the tool and extending substantially the length of said tool from the front to the rear thereof;

a front support member projecting upwardly from said base at a point approximately equidistant from the sides of said tool; and

cutting means including a cutting element secured to said front support member so that said cutting element will contact said workpiece when the tool is moved along said platform, wherein said cutting element comprises an inverted triangular frustum having three different cutting edges comprising the three corners at the inverted base of said frustum.

4,200,130
FARRIER'S HAMMER
John C. Reamy, 413 W. Pittsburg, Broken Arrow, Okla. 74012
Filed Apr. 24, 1978, Ser. No. 899,387
Int. Cl.[2] B25C *1/00*
U.S. Cl. 145—29 R **4 Claims**



1. A farrier's hammer for attaching a horse shoe to a horse hoof and comprising main body means having a head member extending outwardly therefrom in one direction and a claw

portion extending outwardly therefrom in a second direction, a roughened working surface provided on the outer end of the head member for facilitating driving a nail through the horse shoe and horse hoof, said claw portion having a pair of claw members spaced apart by a hiatus of substantially V-shaped configuration for receiving a projecting end of the nail therein, the said claw members being provided with a recess on the inner side thereof for cooperation with the hiatus for wringing of the projection portion of the nail from the horse hoof, and including helical spring means disposed in said recess and having one end thereof anchored against the main body means and the opposite end thereof free for facilitating ejecting of the severed nail portion subsequent to a wringing operation.

4,200,131

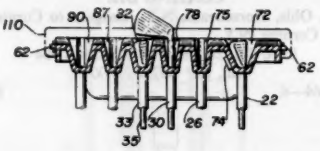
DEVICE FOR CARRYING GOLF CLUBS

Ernest L. Chitwood, 2827 Olive Ave., and Max E. Jones, 42398 Barbary St., both of Fremont, Calif. 94538

Continuation-in-part of Ser. No. 667,360, Mar. 15, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,512

Int. Cl.² A63B *55/00*

U.S. Cl. 150—1.5 R **10 Claims**



1. A device for carrying golf clubs comprising

A. a plate having an upper face,

B. a plurality of holes intersecting said upper face and passing through the plate with each hole being large enough to admit the handle of the golf club,

C. said upper face including golf club receiving surfaces adjacent to at least some of said holes with said surfaces extending from the holes, with the intersections of the planes of said surfaces and the plane of said upper face being parallel and with the angles between the plane of the surfaces and the plane of the upper face corresponding to the loft angles of golf club irons, and with the width of the golf club receiving surfaces being greater than the width of the blade of the corresponding golf club irons,

D. a compartment beneath said plate to enclose handles and shafts of golf clubs with said compartment being longer than the distance between the club head and the end of the handle of golf club irons,

E. a frame connecting said plate to said compartment,

F. carrying means connected to suspend said device with each of said surfaces beneath its adjacent hole,

whereby, when said device is in normal position of use, each golf club iron is urged by gravity to a position with its face in contact with a golf club receiving surface.

4,200,132

MOISTURE PROOF BAG CLOSURE

John R. Avery, 3558 Forest St., Denver, Colo. 80207

Filed Feb. 13, 1979, Ser. No. 11,876

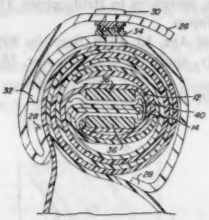
Int. Cl.² B65D *33/24*

U.S. Cl. 150—7 **9 Claims**

1. A container having a sealing arrangement for minimizing the entry of moisture thereto, and the escaping of moisture therefrom, said container comprising:

a bag made of flexible material openable along a portion thereof and including a first wall and a second wall formed to engage each other in sealing relation;

a pair of spaced closure strips connected to said first wall with each of said strips extending laterally thereacross, said first and second walls being foldable when in engagement with each other, so that said closure strips are positioned in parallel adjacent relation to pinch seal said second wall between said pair of spaced closure strips and



thereby substantially prevent moisture from entering said bag along the pinch seal; and

fastening means for holding the pinch seal after the folding of said closure strips.

4,200,133

GOLF BAG COVER

Stanley M. Whitlow, 206 Hickory St., Springhill, La. 71075

Continuation of Ser. No. 871,614, Jan. 23, 1978, abandoned. This application Apr. 27, 1979, Ser. No. 33,843

Int. Cl.² A63B *55/00*

U.S. Cl. 150—52 G **2 Claims**

1. A golf bag cover for protecting clubs therein during inclement weather, comprising:

an elongated, tubular sleeve having a frusto-conical configuration formed of non-selfsupporting, water impervious material, said sleeve defining an upper access opening and a lower opening of greater circumference;

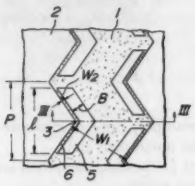
a first continuous elastic band having a circumference less than the upper opening and disposed surrounding the opening; means integral with said sleeve for enclosing said first band;

a second continuous elastic band having a circumference less than the lower opening and greater than said first band disposed surrounding the lower opening; means integral with said sleeve for enclosing said second band so that when the upper portion of a golf bag is received within the sleeve through the lower opening said second band will engage the external surface thereof to mount said sleeve on the bag, whereby the sleeve will extend upwardly over the clubs therein and normally fold over the clubs with the access opening directed downwardly.

4,200,134
HEAVY DUTY PNEUMATIC RADIAL TIRE WITH STRESS MITIGATING RIB

Hiroyoshi Takigawa, Kodaira, and Mitsuhisa Yahagi, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 895,824
Claims priority, application Japan, Apr. 18, 1977, 52-43457
Int. Cl.[2] B60C 11/06
U.S. Cl. 152—209 R 3 Claims



1. In a heavy duty pneumatic radial tire having a tread divided into a plurality of zigzag circumferential ribs along a widthwise direction of the tire by at least two, relatively wide and substantially zigzag main grooves extending circumferentially of said tread, the improvement which comprises: the width of each circumferential rib being at least 10% of the tread width measured in a direction perpendicular to a circumferential direction of the tire, and a stress-mitigating rib arranged at least near a top of each convex part of said circumferential rib projecting toward said main groove in said widthwise direction of the tire, said stress-mitigating rib being substantially parallel to an edge line of said convex part, spaced from said circumferential rib by an isolation groove, having an outer surface co-planar with the outer surface of the adjacent circumferential rib, and satisfying the following relations:

$B/W_1 = 0.10$ to 0.20

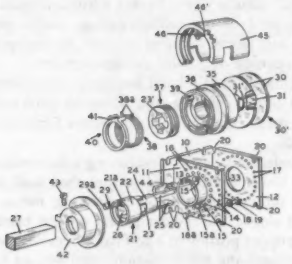
$W_2/W_1 = 0.02$ to 0.05

in which W_1 is a width of said main groove measured in a direction perpendicular to the edge line of said circumferential rib, W_2 is a width of said isolation groove and B is a width of said stress-mitigating rib.

4,200,135
VENETIAN BLIND TILTING AND LIFTING UNIT

Petrus J. Hennequin, Rotterdam, Netherlands, assignor to Hunter Douglas International N.V., Netherlands Antilles

Filed Jun. 2, 1978, Ser. No. 911,822
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1977, 2726452
Int. Cl.[2] E06B 9/30
U.S. Cl. 160—168 A 12 Claims



8. In a drive for a venetian blind which blind has slats that may be raised or lowered by a lift tape and which slats may be tilted by a tilting member and in which said drive includes a lift tape drum, a tilting drum, a drive shaft engaged with the lift tape drum to drive the same, a slip clutch interposed between said drive shaft, and said tilting drum, and a bearing block having two substantially parallel bearing plates between which bearing plates the lift tape drum, the tilting drum, and the slip clutch are positioned and between which bearing plates said drive shaft extends, the improvement wherein an elongated hub extends between and is supported by said bearing plates, said drive shaft extends through said hub, said slip clutch is mounted on said hub in a first axial zone, said tilting drum is mounted on said hub in a second axial zone, said first bearing plate having a first series of holes therethrough, said other bearing plate having a second series of holes therethrough in alignment with said first series, an axle extending between one of the holes of said first series and an aligned hole of said second series, a lift tape guide roller rotatably mounted on said axle, said axle being removably inserted in a pair of said aligned holes for removal and insertion in another pair of aligned holes for adjusting the position of said lift tape roller.

4,200,136
METHOD FOR MAKING AN OPTICAL WAVEGUIDE COATING DIE

James W. Ohls, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 28, 1978, Ser. No. 928,984
Int. Cl.[2] B22D 25/00
U.S. Cl. 164—6 5 Claims

5. A method for making an optical waveguide coating die having a small tapered bore which comprises the steps of:

(a) taper grinding a length of metal rod stock by rotating the stock between a pair of clamped flexible abrasive plates to provide a tapered pin having a taper half-angle not exceeding about 10° and a diameter at its small end not exceeding about 500 microns;

(b) molding a rigid die blank around the tapered pin; and

(c) withdrawing the tapered pin from the rigid die blank to provide a die blank with a tapered bore.

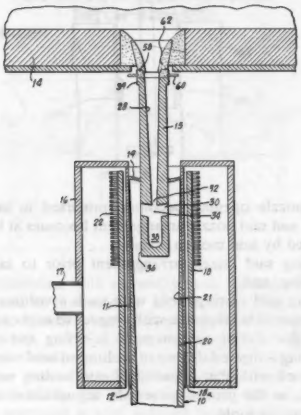
4,200,137
PROCESS AND APPARATUS FOR THE CONTINUOUS CASTING OF METAL USING ELECTROMAGNETIC STIRRING

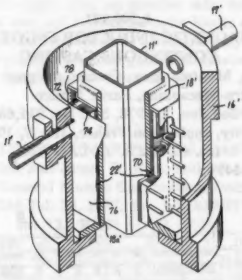
Alexander A. Zavaras, Athens, Greece; Robert Sobolewski, Streetsboro, Ohio; Robert E. Ryan, Highland Heights, Ohio; Michael J. George, Massillon, Ohio, and Cecil B. Griffith, North Royalton, OH, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 571,017, Apr. 22, 1975, abandoned. This application Oct. 4, 1977, Ser. No. 839,206
Int. Cl.[2] B22D 27/02, 11/10
U.S. Cl. 164—49 14 Claims

1. In the continuous casting of metal wherein the liquid metal is poured through a submerged shroud into a cooled mold through which the metal moves in one direction with an outer solidifying shell defining a solid-liquid interface within the mold and which is lined with electrically conductive material, said shroud having a closed bottom and delivering metal to exit outwardly into a region located in an upper portion of the mold, the procedure comprising pouring the metal through

a slag layer in contact with the metal substantially upstream of said region, and electromagnetically circulating the metal in the mold by producing an alternating current field adjacent to the mold between approximately the slag-metal interface and a locality situated downstream of said outward exit, said alternating current being supplied to have at least two successively different phases in longitudinally successive regions to thereby provide circulation of the liquid metal in a direction generally opposite to said one direction along said solid-liquid interface from said locality to the slag layer and generally in said one direction along the outer surface of the shroud, said current being supplied at a frequency sufficiently high to move the





metal in the described circulation and sufficiently low that effective metal-moving power is transmitted despite attenuation by said conductive lining; said field being produced as a field for establishing and maintaining circulation of the liquid metal as a laminar flow along said interface in said opposite direction from said locality to the slag layer, with the rate and direction of the flow being substantially uniform around the entire periphery of the mold at any given level therein, such that the electromagnetically induced metal flow acts as a flowing barrier to positively sweep nonmetallic inclusions entrained in the outflow from the shroud along said solid-liquid interface in spaced relation thereto toward the slag layer whereby removal of inclusions into the slag is promoted.

4,200,138

PROCESS FOR THE SHIELDING OF A CASTING STREAM IN A CASTING APPARATUS

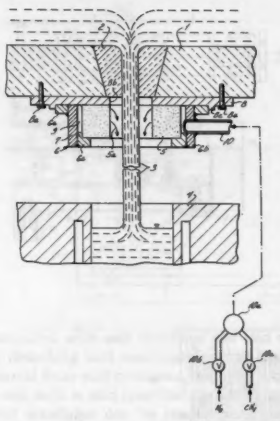
Peter Hildebrandt, Kransberg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation of Ser. No. 778,461, Mar. 17, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,367

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1976, 2611353; Dec. 9, 1976, 2655919

Int. Cl.[2] B22D *11/10*

U.S. Cl. 164—66 **2 Claims**



1. A process for shielding a casting stream of a casting apparatus from oxidation by oxygen in the ambient atmosphere which comprises the steps of:

passing said stream from an outlet of a casting ladle into an inlet end of a casting mold along a flow path with free fall between the outlet and said inlet, the free-fall portion of said path being unconfined thereby being in direct communication with the ambient atmosphere; and

blanketing said stream along said unconfined portion of said path with a gas mixture consisting essentially of a first carrier gas which consists of nitrogen and a second reactive carbon-containing additive gas capable of reacting with oxygen in said stream and the oxygen in the ambient atmosphere, said second gas being selected from the group which consists of unsubstituted and substituted hydrocarbons, the gas mixture being spread along said unconfined portion of said path by forcing it through a porous body juxtaposed with said stream and freely surrounding same, said gas mixture consisting of 5 to 20% by volume of a hydrocarbon, the balance being nitrogen.

4,200,139

LINEAR PERMANENT MOULD CASTING SYSTEM

Cornelius Pluim, Puslinch, Canada, assignor to Cast-Tec Ltd., Oakville, Canada

Filed Dec. 21, 1978, Ser. No. 971,760

Claims priority, application Canada, Feb. 2, 1978, 296175

Int. Cl.[2] B22D *29/00, 47/00*

U.S. Cl. 164—72 **2 Claims**

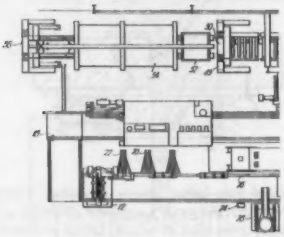
1. A linear, permanent mould casting system having means for indexing and moving mould wagons to a plurality of stations and comprising in series:

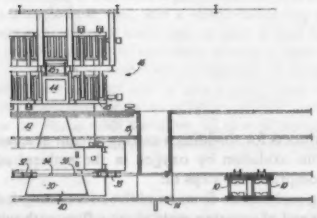
(a) a smoke station for coating the moulds,

(b) a core setting station,

(c) a time reading station for registration of solidification time into a memory system,

(d) a clamping station for securing the moulds in a closed position,
(e) a pouring station with means for filling said moulds,
(f) a cooling and unclamping station for opening said moulds and releasing said castings,
(g) means for receiving and conveying said castings into an insulated container,
(h) a closed loop transport system with means for indexing a plurality of containers which are insulated and refractory lined with firing lid for castings requiring controlled cooling,





(i) a heating system with means for preheating the insulated containers,
(j) a slow-cooling tunnel adjacent said transport system having doors at each end for entrance and exit of castings and including a dumping frame to transfer castings from the insulated containers into cooling containers and a second dumping frame to transfer the cooled castings from the exit end of the tunnel, and
(k) shuttle means for returning the mould wagon to said smoking station.

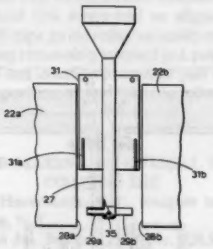
4,200,140

METHOD FOR TEEM-WELDING METALS

Gerhard Einan; Arne Gruben; Erling Klungseth; Ingar Magnussen; Olav O. Moen; Per Vee, all of Øvre Årdal, and Kai M. Vik, Haslum, all of Norway, assignors to Årdal og Sunndal Verk a.s., Oslo, Norway

Filed Nov. 7, 1977, Ser. No. 849,518
Int. Cl.[2] B22D *19/04*
U.S. Cl. 164—105 **17 Claims**

1. A method for teem-welding metal members, particularly members formed of light metals such as aluminum and alloys thereof, said method comprising:
providing a casting mold;
extending at least two workpieces into said casting mold such that at least one surface to be melted of each said workpiece is exposed within the interior of said casting mold;
providing a nozzle arrangement having at least one nozzle opening, and positioning said nozzle arrangement such that said nozzle opening is within said interior of said casting mole and directed substantially at a right angle to and closely adjacent said surfaces to be melted of said workpieces;
injecting molten metal through said nozzle arrangement and said nozzle opening at a pressure sufficient to form at least one jet of molten metal which is directed at a right angle to and concentrated against said surfaces to be melted, and thereby melting said surfaces and the adjacent portions of said workpieces;
continuing injection said molten metal until said casting mold is filled with said molten metal and the melted portions of said workpieces, while maintaining said nozzle opening within said interior of said casting mold such that



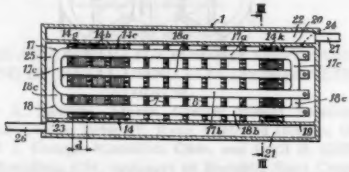
said nozzle opening becomes immersed in said molten metal and said nozzle arrangement becomes at least partly flooded by said molten metal;
preheating said nozzle arrangement prior to said step of injecting; and
providing said casting mold with such a volume and positioning said workpieces with respect to said casting mold such that during said steps of injecting and continuing injecting a desired degree of melting of said workpieces is achieved with that quantity of said molten metal, all of which, as the process proceeds, accumulates in and fills said casting mold.

4,200,141

ELECTROMAGNETIC INDUCTOR INGOT MOLD FOR CONTINUOUS CASTING

Jean Delassus, Montmorency, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Filed Jun. 1, 1978, Ser. No. 911,651
Claims priority, application France, Jun. 7, 1977, 77 17360
Int. Cl.[2] B22C *27/02, 11/00*
U.S. Cl. 164—147 **6 Claims**



1. An electromagnetic inductor ingot mold for the continuous casting of blooms, comprising:
two relatively large and two relatively small rectangular vertical walls assembled to define between them a passage having an elongated rectangular section for the casting of a bloom;
a box for water cooling associated with each of the two relatively large walls, including a second wall disposed parallel to the relatively large wall associated with the box;
braces arranged in a matrix of rows and columns for spacing said vertical walls from said second walls; and
an electromagnetic inductor divided into a plurality of indi-

vidual magnetic circuits and housed in each cooling box for creating a vertically varying magnetic field; including:

a generally comb-shaped core arranged vertically between two adjacent columns of said matrix arrangement of braces and having a plurality of teeth and a plurality of slots which are aligned in the spaces between the rows of said matrix arrangement; and

at least two pairs of rectilinear active conductors horizontally disposed in the aligned slots between the rows of the matrix arrangement to form the windings of said inductor, wherein said core and said conductors form a gridwork which is interlaced with said matrix of braces.

4,200,142

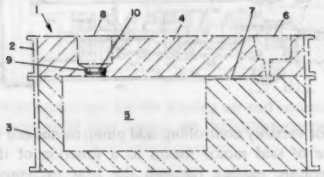
RISER NECK FOR MOLDING CASTINGS

Richard L. Lange, 7635 Staley Rd., New Carlisle, Ohio 45344

Filed Jul. 31, 1978, Ser. No. 929,698

Int. Cl.² B22C *9/02*

U.S. Cl. 164—359 **7 Claims**



1. In combination with a foundry mold having a main mold cavity formed by a removable pattern or holding an expendable pattern, a pouring basin and passage leading therefrom to the mold cavity, and an open riser passage above and having a reduced annular lower end communicating with the mold cavity, of a generally cylindrical inverted thin-walled cup shaped substantially gas impervious riser neck means interposed and arranged in said reduced lower end between said riser passage and mold cavity, said riser neck means comprising a flat closed upper end, an annular side wall depending from said upper end and having an open lower end, whereby said closed upper end functions as a substantially gas tight seal preventing the passage of mold gases therethrough and separates the open riser from the mold cavity.

4,200,143

CONTINUOUS HORIZONTAL CASTER

Robert C. Matter, and James R. Bish, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 28, 1977, Ser. No. 819,897

Int. Cl.² B22D *11/10, 37/00*

U.S. Cl. 164—440 **1 Claim**

1. In apparatus for continuously casting lengths of metal including a coolable mold, a source of melt coupled to the mold for continuously supplying melt to the mold during casting, a block of insulating material disposed between said mold and said source for substantially thermally isolating said mold from said source, and an orifice through said block for passing melt from said source to said mold, the improvement wherein said source comprises:

a container having a plurality of walls defining a reservoir for containing said melt;

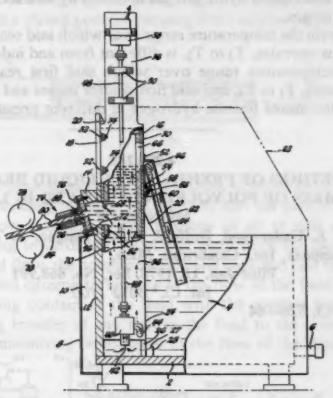
a standpipe affixed to one of said walls and extending into said reservoir;

an inlet at the lower end of said standpipe for withdrawing melt from said reservoir;

a port in said standpipe adjacent said orifice and intermediate said lower end and the upper end of said standpipe for passing melt from said standpipe to said orifice;

control means at the upper end of said standpipe for maintaining a substantially constant level of melt in said standpipe above said port during casting, said level serving to establish a metalostatic head of melt pressing on the melt at the orifice and corresponding to the height of said level above said orifice;

pump means affixed to said standpipe for lifting melt from said reservoir to said level within said standpipe during casting and for rapidly dropping the melt level in said standpipe to beneath said orifice at the end of casting; and



means associated with said standpipe and said one wall for readily detaching said standpipe from its associated wall for removal from said container, said means being located above said melt in said reservoir for easy access and such that said standpipe can be readily removed from said reservoir for servicing without emptying said reservoir or otherwise significantly disturbing the melt in the reservoir.

4,200,144

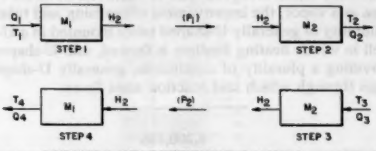
HYDRIDE HEAT PUMP

Bruce E. Sirovich, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 2, 1977, Ser. No. 802,800

Int. Cl.² A28D *15/00*

U.S. Cl. 165—1 **8 Claims**



SCHEMATIC OF SIMPLE HYDRIDE HEAT-PUMP CYCLE

1. A method for transferring heat energy between two different temperatures comprising:

chemically forming and decomposing hydrides by reaction of hydrideable materials with hydrogen gas in a plurality of hydride-dehydride reactor means, said plurality comprising first and second reactor means with said first and second reactor means comprising first and second hydrideable materials, respectively, wherein said first and second hydrideable materials are of dissimilar compositions;

supplying heat at temperatures T_1 to said first reactor means to promote the decomposition of said hydrided materials in said first reactor means and liberate hydrogen gas;

allowing hydrogen gas to transfer between said first and second reactor means;

removing heat at temperature T_2 from said second reactor means as said hydrideable materials contained therein

exothermically absorb said hydrogen gas liberated by said first reactor means;

supplying heat at temperature T_3 to said second reactor means to promote the decomposition of said hydrided materials in said second reactor means to liberate said absorbed hydrogen gas; and

removing heat at T_4 from said first reactor means as said hydrideable materials contained therein exothermically absorb said hydrogen gas liberated by said second reactor means,

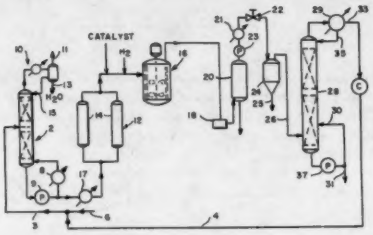
wherein the temperature range over which said second reactor means operates, T_3 to T_2, is different from and independent of the temperature range over which said first reactor means operates, T_1 to T_4, and said first reactor means and said second reactor means liberate hydrogen at different pressures.

4,200,145

METHOD OF PREHEATING A LIQUID REACTION MASS OF POLYOLEFIN DISSOLVED IN LIQUID MONOMER

Max E. Underwood, Bedford, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.

Filed Jan. 12, 1978, Ser. No. 868,991
Int. Cl.² B01J *1/00*
U.S. Cl. 526—64 **3 Claims**



1. In a method of catalytically polymerizing olefins from liquid olefin monomer under positive pressure, in which the reaction mass comprises polyolefin dissolved in liquid olefin monomer and in which the reaction mass is flowed through the tubes of a tubular heat exchanger to heat it through the critical temperature and pressure of said monomer to a temperature at which the liquid monomer can be removed from the reaction mass as a vapor, the improvement comprising said tubes being a plurality of generally U-shaped tubes mounted in a U-shaped shell in which heating medium is flowed, said U-shaped tubes providing a plurality of continuous, generally U-shaped passages through which said reaction mass flows.

4,200,146

METHOD AND APPARATUS FOR HYDRAULICALLY DRIVING AND CONTROLLING A COOLING FAN

John R. Olson, Oconomowoc, Wis., assignor to Dynex/Rivett Inc., Pewaukee, Wis.

Filed Nov. 4, 1977, Ser. No. 848,683
Int. Cl.² F01P *7/02*
U.S. Cl. 165—39 **5 Claims**

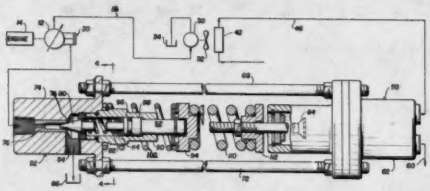
1. An apparatus for hydraulically driving and controlling a cooling fan comprising:

a working hydraulic fluid loop including,

pump means driven by a prime mover and having a first working output and a second control output means, said pump means being operable for pumping hydraulic fluid from a sump to said first and second output means, said pump means comprising a variable delivery pump wherein the fluidic displacement from the pump to said first output means is controlled by regulating the operating pressure thereof, and

motor means for driving a cooling fan, said motor means being connected directly to said first output means of said pump means and being continuously driven directly by the hydraulic output from said first output means and thereafter said motor means returning the hydraulic fluid to a sump, said motor means comprising a fixed delivery motor wherein the torque of said motor means is a direct function of fluid displacement and pressure from said first output means from said pump means;

means external of said hydraulic fluid loop for sensing the temperature of fluid passing through a heat exchanger associated with the cooling fan, said means comprising a temperature/force transducer means connected to a relief valve means for regulating said relief valve means in response to variations in the temperature of fluid passing through the heat exchanger; and



means for variably controlling said pump means and thus the torque of said motor means as a function of the fluid temperature passing through the heat exchanger, said means for variably controlling comprises a pressure compensation regulator connected to said variable delivery pump and hydraulic and relief valve means connected to said pressure compensation regulator for controlling the pressure of said regulator, wherein an increase in sensed fluid temperature will produce an increase in pressure applied to said motor means and an increase in cooling fan speed while a decrease in sensed fluid temperature will produce a decrease in pressure applied to said motor means and decrease in cooling fan speed.

4,200,147

DEVICE FOR THE EXCHANGE OF HEAT BETWEEN SUPPLY AIR AND EXHAUST AIR IN INDOOR PREMISES

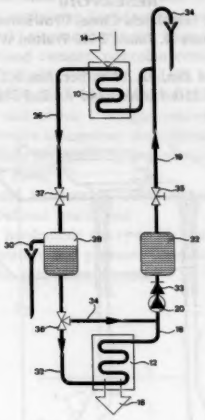
Hans S. Hedbom, Sollentuna, Sweden, assignor to Aktiebolaget Carl Munters, Sollentura, Sweden

Filed Dec. 9, 1977, Ser. No. 859,034
Claims priority, application Sweden, Dec. 17, 1976, 7614240
Int. Cl.² F28D *21/00*
U.S. Cl. 165—104 S **4 Claims**

1. In a heat exchanger system in which sensible and/or latent heat is exchanged between a stream of incoming air into an enclosure and a stream of air leaving the enclosure, comprising a heat exchanger for the incoming air stream and a heat exchanger for leaving air stream, each of said exchangers comprising a group of passages through which the incoming air stream and the leaving air stream, respectively, are passed in heat exchange relationship with a liquid pumped through a separate group of passages, said liquid being circulated in a closed circuit comprising a first duct (**26**, **26***a*) leading from the heat exchanger for the incoming air to the heat exchanger for the leaving air, and a second duct (**19**, **19***a*) leading from the heat exchanger for the leaving air to the heat exchanger for the incoming air, the improvement for defrosting the heat exchanger for the leaving air, comprising:

(a) a valve-controlled cross duct interconnecting said first and second ducts for by-passing the heat exchanger for the leaving air; and

(b) a heat buffer connected in series with said second duct for storing an undivided portion of the heated liquid from



the heat exchanger for the leaving air and communicating with said cross duct during the defrosting operation.

4,200,148

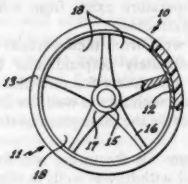
STORING AND EXTRACTING LATENT HEAT

Jerome M. Friefeld, Agoura, and Jacob Silverman, Woodland Hills, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 3, 1978, Ser. No. 892,723

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—104 S **1 Claim**



1. A thermal energy storage and extraction system, which comprises:

an inner tube for conveying a heating and a heat extracting fluid;

a plurality of fins tapering in a radially outer direction wherein each of said fins is radially and longitudinally disposed along said inner tube;

an outer tube concentric with said inner tube and connected to said inner tube through said fins;

a plurality of compartments defined by forward and aft closures, by said inner tube and said outer tube on its radial extremities, and by said adjacent fins on its sides; and

a thermal storage medium located within said compartments.

4,200,149

HEAT EXCHANGER WITH FLUID TURBULATOR

Murray Pechner, 2309 W. 144th St., Gardena, Calif. 90249

Filed Dec. 6, 1976, Ser. No. 747,620

Int. Cl.[2] F28F *1/40, 13/12*

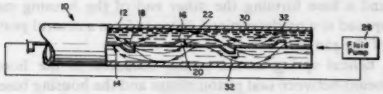
U.S. Cl. 165—109 **8 Claims**

1. A fluid turbulator for enhancing heat transfer from oil in an oil cooler of an internal combustion engine having at least one conduit which establishes a unidirectional fluid flow path for the oil from an inlet to an outlet comprising:

a generally planar strip positioned in the conduit;

means defining openings in said strip for permitting the flow of the fluid therethrough; and

a plurality of louvered cups equal in number to said opening means and positioned at said opening means, and each having a leading edge extending out of the plane of said strip and a closed portion merging from said leading edge



into the plane of said strip, said leading edges of all of said cups extending towards the inlet and into the path of the fluid flow and said closed portions of all of said cups extending towards the outlet and away from the path of the fluid flow, the combination of said cups and said opening means causing turbulence in the flow of the fluid and increasing contact of the fluid with the conduit for enhancing transfer of any heat in the fluid to the conduit, while minimizing impediment to the flow of the fluid.

4,200,150

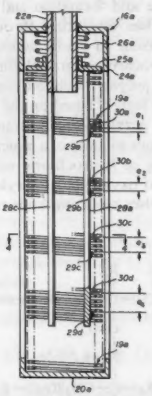
METHODS AND HYDRAULICALLY EXPANDABLE SELF-CLEANING SAND SCREENS

Fuad T. Saadeh, Bellaire, and Marc F. Fontaine, Houston, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,747

Int. Cl.[2] E21B *43/08*

U.S. Cl. 166—231 **14 Claims**



1. A method for assembling a helical spring screen assembly for use on a production tube for producing sand-free liquid, the production tube having means for generating a pulse therein comprising the steps of,

(a) forming a closed ended cylinder with an opening in the closed end for the production tube to extend through,

(b) slideably mounting an annular piston in the cylinder for sliding movement around the production tube from a neutral position,

(c) securing a housing to the cylinder with a base at a predetermined fixed distance from the piston neutral position, and

(d) fixedly securing the opposite ends of a helical spring screen between the base and the annular piston, respec-

tively, whereby upon generation of a hydraulic pulse in the helical spring screen, the helical spring screen is expanded and the coils thereof washed clean.

8. A self-cleaning helical spring screen assembly for producing sand-free liquid from a production tube extending down into the top of the assembly when lowered in a well comprising,

(a) an open housing means comprising a closed ended cylinder having a piston means therein forming one end of the housing means with a production tube extending therein and a base forming the other end of the housing means spaced at a predetermined distance from a neutral position of the piston,

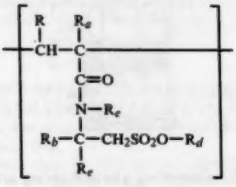
(b) helical spring screen means mounted in the housing means between said piston means and the housing base for being expanded by a hydraulic pulse in the helical spring screen means for separating the spring coils for cleaning thereof by expulsion of the liquid between the expanded coils.

4,200,151
SECONDARY RECOVERY PROCESS

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 752,938, Dec. 22, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,134
The portion of the term of this patent subsequent to Aug. 7, 1996, has been disclaimed.
Int. Cl.[2] E21B *43/27*
U.S. Cl. 166—271 **4 Claims**

1. A process for recovering hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and in fluid communication, which comprises displacing through the formation a composition comprising an acidic aqueous polymer solution and recovering hydrocarbons through the production well, the said acidic aqueous polymer solution comprising about 0.1 to about 10 percent by weight based on the total solution weight of an oxyalkylated acrylamido alkanesulfonic acid polymer dissolved in an aqueous solution of a mineral acid selected from the group consisting of hydrochloric acid and sulfuric acid, and wherein the said oxyalkylated acrylamido alkanesulfonic acid polymer comprises recurring units of the formula:

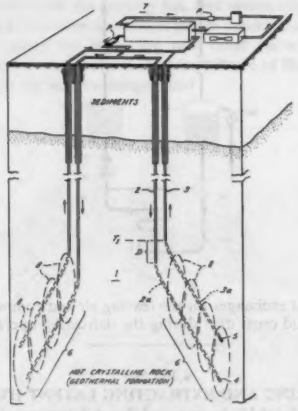


wherein R, R_a, R_b and R_c are independently selected from the group consisting of hydrogen and alkyl having from 1 to 5 inclusive carbon atoms, R_d is selected from the group consisting of hydrogen and $-(C_2H_4O)_mM$, wherein m is an integer of from 1 to about 20 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium and R_e is selected from the group consisting of hydrogen and $-(C_2H_4O)_sM$ wherein s is an integer of from 1 to about 20 and with the proviso that when R_d is hydrogen, then R_e is $-(C_2H_4O)_sM$ and when R_e is hydrogen, then R_d is $-(C_2H_4O)_mM$, and wherein the average molecular weight of the polymer ranges from about 1,000 to about 1,000,000.

4,200,152
METHOD FOR ENHANCING SIMULTANEOUS FRACTURING IN THE CREATION OF A GEOTHERMAL RESERVOIR

John W. Foster, 2 Highlands Close, Crowborough, Sussex, England, and Clarence R. Jones, 3445 Walton Way, Augusta, Ga. 30909

Filed Jan. 12, 1979, Ser. No. 3,122
Int. Cl.[2] E21B *43/26*; F24J *3/02*; F28D *21/00*
U.S. Cl. 166—271 **3 Claims**



1. A process for creating a fracture complex in a hot dry rock formation, comprising the steps of:

(a) drilling at least one fluid injection well and one fluid withdrawal well which are approximately vertical to the approximate location within a crystalline rock formation at which a temperature exists from which useful heat energy may be extracted;

(b) deviating said wells from their vertical orientation in a direction approximately perpendicular to the compass direction of the most likely fracture plane of said formation such that said withdrawal well lies above, parallel to and in approximately the same plane as the fluid injection well;

(c) orientating means for fracturing said formation within said injection and withdrawal wells in alignment with the vertical direction of the anticipated fracture plane of said formation,

(d) gradually pressuring the fracture means to a level slightly below the rock failure pressure of said formation and simultaneously fracturing said formation from the injection and withdrawal wells by suddenly exerting pressure in excess of said rock failure pressure in said fracturing means simultaneously to produce a single interconnecting fracture of large surface area connecting said wells for hydraulic communication.

4,200,153
METHOD FOR CEMENTING HIGH TEMPERATURE WELLS

Julius P. Gallus, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 844,642, Oct. 25, 1977, Pat. No. 4,144,077, which is a continuation-in-part of Ser. No. 700,387, Jun. 28, 1976, Pat. No. 4,069,870. This application Dec. 8, 1978, Ser. No. 967,883
Int. Cl.[2] E21B *33/14*
U.S. Cl. 166—292 **12 Claims**

1. A method for placing a hardened cement mass having improved resistance to degradation of its ultimate permeability

and compressive strength when exposed to high temperatures in a confined space in fluid communication with a well, comprising:

forming a hardenable slurry comprised of a cement system and a water-containing liquid vehicle, said cement system comprising (1) a cement selected from the group consisting of Portland cement, pozzolan cement, high alumina cement and mixtures thereof, and (2) a carbon black cement additive which is present in an amount, between about 0.01 and about 1 weight percent of said cement system, effective to improve the resistance to degradation of the ultimate permeability and compressive strength of said cement mass;

introducing said hardenable slurry through said well and into said confined space; and

allowing said hardenable slurry to set and harden under the high temperature and pressure conditions in said well to thereby form said cement mass.

4,200,154

COMPOSITION AND METHOD FOR STIMULATING WELL PRODUCTION

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

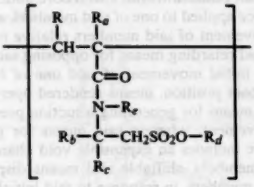
Continuation-in-part of Ser. No. 752,940, Dec. 22, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,135

The portion of the term of this patent subsequent to Aug. 7, 1996, has been disclaimed.

Int. Cl.² E21B *43/27*

U.S. Cl. 166—307 **16 Claims**

1. An aqueous well acidizing composition comprising an aqueous solution of from about 2 to about 12 percent by weight of a mineral acid selected from the group consisting of hydrochloric and sulfuric acid, from about 1 to about 7 percent by weight of hydrofluoric acid and having dissolved therein from about 0.5 to about 5 percent by weight of an oxyalkylated acrylamido alkanesulfonic acid polymer comprising recurring units of the formula:



wherein R, R_a, R_b and R_c are independently selected from the group consisting of hydrogen and alkyl having from 1 to 5 inclusive carbon atoms, R_d is selected from the group consisting of hydrogen and $-(C_2H_4O)_mM$, m is an integer of from 1 to about 20 and and M is selected from the group consisting of hydrogen, sodium, potassium, and ammonium and R_e is selected from the group consisting of hydrogen and $-(C_2H_4O)_sM$, wherein s is an integer of from 1 to about 20 and with the proviso that when R_d is hydrogen, then R_e is $-(C_2H_4O)_sM$ and when R_e is hydrogen, then R_d is $-(C_2H_4O)_mM$ and wherein the average molecular weight of the polymer ranges from about 1,000 to about 1,000,000.

4,200,155

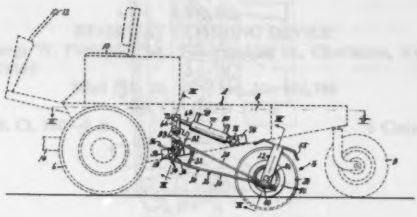
LAWN EDGER ATTACHMENT

David L. Mallet, Hesston; Raymond J. Rilling, Moundridge, and Elmer D. Voth, Newton, all of Kans., assignors to Excel Industries, Inc., Hesston, Kans.

Filed Aug. 31, 1978, Ser. No. 938,636

Int. Cl.² A01G *3/06*

U.S. Cl. 172—14 **10 Claims**



1. A lawn edger attachment for a self-propelled vehicle, said attachment comprising:

a. a horizontal shaft extending laterally from said vehicle,

b. means mounting said shaft on said vehicle for oscillation about its axis,

c. power means mountable on said vehicle and operable to oscillate said shaft,

d. an elongated arm attached at one end to said shaft and projecting laterally and generally horizontally therefrom,

e. a bracket attached to the extended end of said arm, and

f. a circular coulter blade disposed in a generally vertical plane and carried for rotation on its axis by said bracket, said axis being generally parallel to said shaft, said arm constituting a parallelogram linkage including a pair of spaced apart generally parallel side links each pivoted at its respective ends to said shaft and to said bracket, for pivotal movement on parallel axes generally normal to a plane including the axes of said shaft and said coulter blade, whereby said arm may be pivoted angularly from side to side without correspondingly angling the vertical plane of said blade, said blade being operable by said power means, as the latter pivots said shaft, to be lowered into penetrating relation with the soil of a lawn at the line of demarcation between said lawn and a paved surface.

4,200,156

SOIL CULTIVATING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N.V., Maasland, Netherlands

Filed Dec. 2, 1977, Ser. No. 856,762

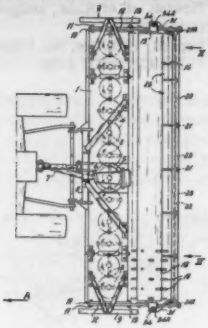
Claims priority, application Netherlands, Dec. 3, 1976, 7613474

Int. Cl.² A01B *71/08, 29/06*

U.S. Cl. 172—59 **15 Claims**

1. A soil cultivating implement comprising a frame and soil working means rotatably mounted on said frame, said soil working means comprising a plurality of rotatable soil working members and driving means connected to rotate said members, said soil working means further including an elongated supporting roller that is located to the rear of said soil working members, said roller being pivotably connected to said frame with arms and displaceable upwardly and downwardly about a pivotal axis in position relative to said frame, means retaining said arms in adjusted angular settings about the pivotal axis relative to said soil working members, said arms extending to the rear of said roller and scraping elements supported on common carrier means that is connected to said arms rearwardly of said roller, said scraping elements comprising parts that extend downwardly from the carrier to engage the outer surface of the roller at a point below the latter's axis of rota-

tion, and immediately above the ground surface, the position of each element being defined by a first plane passing through said point and the axis of rotation of said roller, said first plane



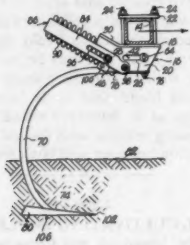
being inclined to the horizontal by an angle of at least 10°, a further plane tangential to said point being inclined to at least a major portion of said element whereby soil is shed substantially immediately as said outer surface leaves the ground.

4,200,157

SPRING CUSHIONED SHANK FOR EARTHWORKING CHISEL HAVING TRIP MECHANISM WITH AUTOMATIC RESET

Carl M. Anderson, Claremore, Okla., assignor to Hesston Corporation, Hesston, Kans.

Filed May 8, 1978, Ser. No. 903,509
Int. Cl.[2] A01B *61/04, 35/24*
U.S. Cl. 172—264 **5 Claims**



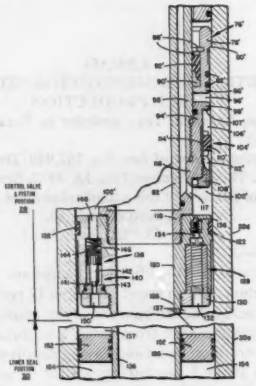
1. In a farm implement, a shank assembly including:
a tool-supporting shank and a ground-engaging tool attached to said shank;
means supporting the shank for up and down swinging movement and for reciprocable movement fore and aft of the path of travel of the implement; and
resilient means yieldably restricting the shank to said reciprocable movement during normal tool operating conditions and certain abnormal resistances encountered by said tool,
said resilient means being disposed to maintain a yieldable bias against upward swinging movement of the shank resulting from the tool encountering relatively immovable obstructions, whereby to automatically reset the tool after clearing the obstructions,
there being a releasable locking means for said assembly arranged to permit aft movement of said shank in opposition to the resistance of said resilient means and preclude upward swinging movement of the shank until the assembly is unlocked,
said assembly including a shank-supporting carriage, said resilient means acting on the carriage to yieldably bias the same toward the forward end of its path of travel,
said carriage being pivotally mounted for up and down swinging movement, said locking means holding the carriage against upward swinging movement until it moves a predetermined distance rearwardly against the action of said resilient means,
said means supporting the shank being U-shaped, presenting a bight having a pair of downturned legs, each leg being provided with an elongated slot, the pivotal mounting for the carriage comprising a pivot member passing through the carriage and the slots,
said carriage being U-shaped, presenting a plate having a pair of upturned flanges between said legs, the plate being movable fore and aft beneath said bight, the pivot member passing through said legs.

4,200,158

FLUID RETARDED ACCELERATING JAR WITH NEGATIVE AND POSITIVE PRESSURE CHAMBERS

Lee E. Perkins, P.O. Box 6034, Houma, La. 70360, assignor to Lee E. Perkins, Houma, La.

Filed Mar. 3, 1978, Ser. No. 883,316
Int. Cl.[2] E21B *1/10*
U.S. Cl. 175—297 **21 Claims**



1. In combination with a jarring device having a pair of axially elongated members displaceable relative to each other toward an impact position within a well bore under a predetermined axial force applied to one of said members, apparatus for controlling movement of said members relative to each other comprising: fluid retarding means for opposing said axial force in response to initial movement of said one of the members toward the impact position, means rendered operative by the fluid retarding means for generating a suction pressure during said initial movement, wherein said means for generating a suction pressure includes an expansible void chamber formed between said members, shiftable seal means displaceable by said one of the members, in response to said initial movement, to an operative position sealing the void chamber, and means responsive to pressure generated by the fluid retarding means while opposing said tensioning force for holding the seal means in said operative position, release means interconnecting the fluid retarding and means for generating a suction pressure following said initial movement for disabling the fluid retarding means to permit acceleration of said one of the members by the axial force to the impact position, and means responsive to said disabling of the fluid retarding means for increasing said acceleration of said one of the members as a function of the suction pressure generated, wherein said release means includes position responsive valve means for conducting flow of fluid between the fluid retarding means and the void chamber

in by-pass relation to the seal means to equalize pressures at a predetermined negative pressure below static well bore pressure.

4,200,159

CUTTER HEAD, DRILL BIT AND SIMILAR DRILLING TOOLS

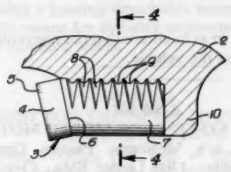
Eberhard Peschel; Hermann Rathkamp; Klaus Katzorke, and Rainer Jurgens, all of Celle, Fed. Rep. of Germany, assignors to Christensen, Inc., Salt Lake City, Utah

Filed Dec. 2, 1977, Ser. No. 856,656

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1977, 2719330

Int. Cl.[2] E21B *9/36*

U.S. Cl. 175—329 23 Claims



1. A drill bit, comprising a connection body, a basic body of a matrix-binder composition secured to said connection body, cutting structures secured to said basic body, the axis of each cutting structure extending transversely of the bit axis, each of said structures comprising a carrier of high rigidity secured to said basic body and being initially a part separate from said basic body, said carrier having a back face abutting said basic body over substantially the entire area of said back face, and a plurality of cutting members each including a support and diamonds on the front face of said support, said cutting member and its support and diamonds being arranged in substantial alignment with each carrier, basic body and back face of said carrier, each of said cutting members having a back face of said support confronting a forward face of said carrier, and means securing substantially the entire area of said back face of said support to said forward face of said carrier.

4,200,160

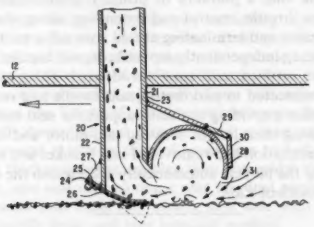
SWEEP PICKUP FOR A BIG HOLE BIT

Alan L. Newcomb, Rancho Palos Verdes, Calif., assignor to Smith International, Inc., Newport Beach, Calif.

Filed Mar. 13, 1978, Ser. No. 885,882

Int. Cl.[2] E21C *13/02*

U.S. Cl. 175—340 8 Claims



1. A large diameter drill bit adapted to rotate in one direction comprising:

a main bit body having a base section for rotatively supporting a plurality of cutters, said main bit body further having a central conduit formed therein for receiving drilling fluid,

a sweep pickup communicating at one end with said central conduit with the other end extending downwardly to the face of the bore hole to form a sweep inlet, said sweep inlet having leading and trailing sides, said sweep pickup further having means for creating a fluid vortex adjacent to the sweep inlet, said fluid vortex creating means comprising a semi-cylindrical chamber having an opening facing the sweep inlet, said chamber being located adjacent the trailing side of the sweep inlet.

4,200,161

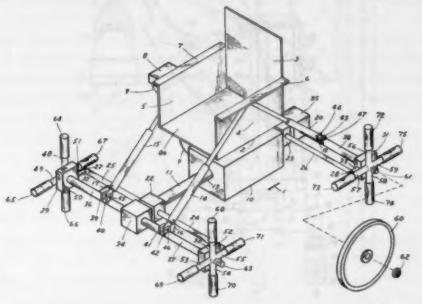
STAIRWAY CLIMBING DEVICE

George W. Penington, Jr., 9-D Franklin St., Charleston, S.C. 29401

Filed Feb. 10, 1976, Ser. No. 656,788

Int. Cl.[2] B62D *57/02*

U.S. Cl. 180—8 A 5 Claims



1. A device capable of moving on a stairway comprised of a plurality of steps comprising:

(a) power means secured on said device;

(b) a plurality of front and rear spoked wheels secured on said device, said plurality of spoked wheels comprising a plurality of spokes being movable by said power means; each of said plurality of spokes being spaced apart, extending from a center section, and comprising a rigid end section which contacts one of said plurality of steps while said device is moving, each end section comprising a spoke tip which is a rigid piece axially aligned with each of said plurality of spokes and mounted at the distal end from the hub on each of said plurality of spokes; said plurality of spoked wheels further comprising a plurality of axle extensions, each secured to and extending outward from one of said center sections of the wheel; said power means providing power to said center section to provide movement for each of said plurality of spokes;

(c) a plurality of round wheels each of which may be secured to one of said plurality of spoked wheels whereby said device may smoothly move over a level area and each of said plurality of round wheels may be secured on each of said plurality of axle extensions

whereby each of said plurality of spokes contacts one of said plurality of steps when said device is moving along said stairway.

4,200,162

TRAVELING GANTRY

Hans Tax, Potsdamer Strasse 3, D-8000 Munich 40, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,559

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713692; Aug. 5, 1977, 2735385

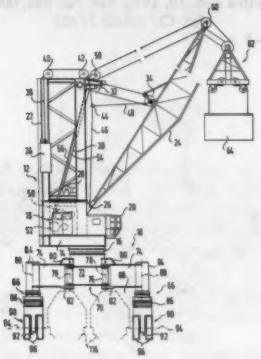
Int. Cl.[2] B62D *5/04*

U.S. Cl. 180—23 15 Claims

13. A traveling gantry comprising:

(a) a bridge portion including:

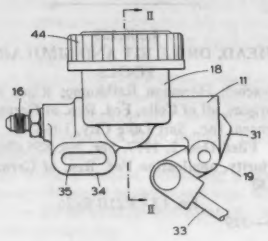
(1) a platform having an upwardly directed face, said face defining a normally horizontal plane,
(2) a plurality of elongated carrier arms,
(3) a plurality of hinge means securing respective longitudinal end portions of said carrier arms to said platform for pivoting movement in a plane parallel to and adjacent to said horizontal plane about respective pivot axis spaced from each other and transverse to said planes, and
(4) each said carrier arm having a free longitudinal end portion remote from the associated said hinge means;
(b) at least one road wheel secured to said free longitudinal



end portion of each said carrier arm for movement about a horizontally extending axis of rotation;
(c) steering means for turning said wheel about an upright steering axis transverse to said axis of rotation; and
(d) a plurality of supports respectively mounted on said carrier arms and adjustably extendable downward from the same, when extended respective lowermost portions of said supports defining a plane of engagement with subjacent ground, respective lowermost circumferential parts of said wheels defining a plane tangential to said parts, and shifting means in operative engagement with said supports for shifting said planes relative to each other in the vertical direction.

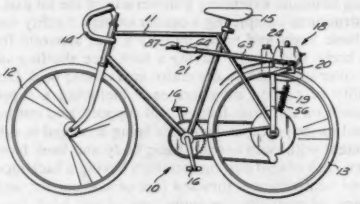
4,200,163
HYDRAULIC ACTUATOR
Richard A. Bass, Leamington Spa, and Peter S. K. Grossart, Braunston, both of England, assignors to Automotive Products Limited, Leamington Spa, England
Filed Jul. 13, 1978, Ser. No. 924,295
Claims priority, application United Kingdom, Aug. 4, 1977, 32671/77
Int. Cl.[2] B60T *17/06*
U.S. Cl. 180—219 **7 Claims**

1. A motor vehicle hydraulic reservoir and master cylinder assembly having:
a hydraulic master cylinder;
a reservoir mounted directly onto the master cylinder;
a mounting means on the master cylinder for mounting said cylinder onto a vehicle without the limitation of maintaining a reservoir in an upright position; and
an adjustable means securing the reservoir to the master cylinder, so that the attitude of the reservoir can be selec-



tively adjusted so as to ensure that the reservoir is substantially upright on the vehicle.

4,200,164
CONTROL SYSTEM FOR MOPED MOTOR
Frank S. Pearne, c/o McNenny, Pearne, Gordon, Gail, Dickinson & Schiller, 1200 Leader Bldg., Cleveland, Ohio 44114
Filed Jun. 19, 1978, Ser. No. 916,951
Int. Cl.[2] B62K *11/10*
U.S. Cl. 180—206 **15 Claims**

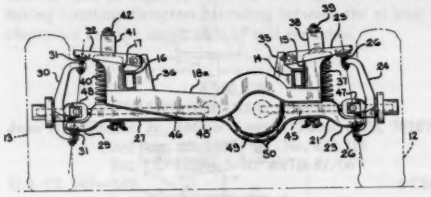


1. A motor mounting and control device for a bicycle comprising bracket means adapted to be removably secured to a bicycle frame, a motor carried on said bracket means and adapted to propel the bicycle through one of its wheels, a motor control handle mounted on said bracket means, said motor control handle being adapted to extend from the area of the motor and terminate with its end at a zone generally adjacent the body of the rider for convenient hand engagement of such handle end, a plurality of primary motor control rods including a throttle control rod extending along the handle from the motor and terminating at said zone adjacent the rider, said rods being independently movable on said handle between at least two settings, said control rods each being separately operably connected to said motor, said handle and removable bracket means providing the sole support for said motor control rods along their length between said motor and said zone whereby installation and removal of said bracket and motor on the frame of the bicycle automatically accomplish the same for the motor control rods.

4,200,165
INTEGRAL SWING ARM
Miles A. Bowman, Jr., and Jack A. Schaeffer, both of Reading, Pa., assignors to Dana Corporation, Toledo, Ohio
Continuation of Ser. No. 921,241, Jul. 3, 1978, abandoned. This application Oct. 16, 1978, Ser. No. 951,494
Int. Cl.[2] B60K *17/30*
U.S. Cl. 180—253 **13 Claims**

5. A suspension for a driven wheel on a vehicle comprising

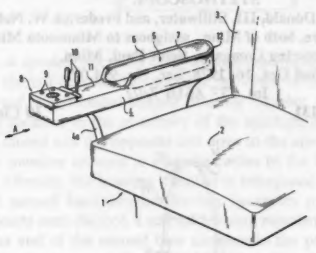
a stamped metal swing arm having first and second ends, means for pivotally attaching said first end to such vehicle, means for mounting said wheel on said second end, a differential gear having a housing detachably mounted on said swing arm, and axle means for drivably connecting said differential gear to said mounted wheel.



4,200,166
ARM REST FOR THE OPERATOR'S SEAT ON A MOVING MACHINE

Rudolf Hansen, Freising, Fed. Rep. of Germany, assignor to Steinbock GmbH, Moosburg, Fed. Rep. of Germany

Filed Apr. 18, 1978, Ser. No. 897,561
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1977, 2718579
Int. Cl.² B60K *23/00*
U.S. Cl. 180—77 R **8 Claims**



1. In an operator's support for a movable machine including a horizontally extending seating surface, back rest means for limiting rearward movement of an operator seated on said surface, and an armrest laterally offset from said surface and upwardly projecting beyond the same, the improvement in the armrest which comprises:

the armrest having a horizontally extending top face elongated in a forward and rearward direction, said top face having two longitudinal edge portions one remote from and one adjacent said surface respectively;

a side wall projecting upwardly from said adjacent edge portion, the height of said side wall being smaller than the length thereof in said direction and at least equal to the horizontal thickness thereof transverse to said direction, said thickness being smaller than the width of said top face, said side wall having a rear terminal portion closely adjacent said back rest means, said side wall extending forwardly from said rear terminal portion;

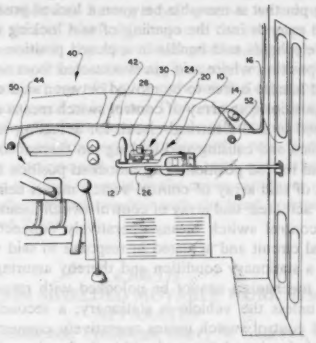
said top face having a longitudinally terminal front portion remote from said back rest means, a plurality of control elements for controlling operation of said machine being movably mounted on said armrest and projecting upwardly from said front portion; and

another side wall projecting upward from said remote edge portion, said other side wall being elongated in said direction, said side walls being transversely spaced from each other and having respective terminal front portions longitudinally coextensive with said longitudinally terminal front portion of said top face, the terminal front portions of said side walls flaring in a forward direction.

4,200,167
SAFETY INTERLOCK SYSTEM FOR A SCHOOL BUS DOOR OR THE LIKE

Euliss C. Cockman, Jr., Rte. 1, Box 104-B, Carthage, N.C. 28327

Filed Dec. 11, 1978, Ser. No. 968,495
Int. Cl.² B60R *18/00*
U.S. Cl. 180—281 **15 Claims**



1. A safety actuating control system for locking and unlocking a handle operatively connected to a door of a vehicle such as a bus or other type of passenger vehicle wherein said handle is movable between closed and opened positions, said safety actuating control system comprising: an electrical circuit operatively connected to a power supply point of said vehicle and electrically connected to a locking mechanism operatively associated with said handle and operative to lock said handle in said closed position in a locked mode of operation and to release the handle in an unlocked mode of operation, said locking mechanism including an electrically actuated locking pin that is movable between a locked position where said pin effectively holds said handle in a closed position and an unlocked position where said handle is free to be moved between said opened and closed positions; an array of control switch means operatively connected in said electrical circuit for actuating said locking mechanism and causing said locking pin thereof to be moved from said locked position to an unlocked position in response to each of said array of control switch means being simultaneously actuated; said array of control switch means including a first control switch means operatively connected in said electrical circuit and actuated in response to said vehicle assuming a stationary condition and thereby assuring that said locking mechanism cannot be unlocked with respect to said handle unless the vehicle is stationary; a second manually actuated control switch means operatively connected in said electrical circuit and disposed within the hand reach access of the vehicle driver such that the driver can actuate the same, thereby assuring that said locking mechanism cannot be unlocked unless said second control switch means is actuated by said driver; a third manually actuated control switch means disposed at a distance from said second manual actuated control switch means and out of the reach of said driver such that a second person is required to actuate the same and thereby assuring that said locking mechanism cannot be actuated unless said third control switch means is actuated by a person other than the driver; and an override mechanism associated with said locking mechanism for allowing said locking mechanism to be disassociated from said handle in order that said handle can be manually operated without regard to said safety actuating control system.

12. A safety actuating control system for locking and unlocking a handle operative connected to a door of a vehicle such as a bus or other type of passenger vehicle wherein said handle is movable between closed and opened positions, said safety actuating control system comprising: a door handle having a locking tongue secured thereto and extending therefrom and provided with an opening formed therein; an electrical circuit operatively connected to a power supply point of said vehicle and electrically connected to a locking mechanism operatively associated with said handle and operative to lock said handle in said closed position in a locked mode of operation and to release the handle in an unlocked mode of operation, said locking mechanism including an electrically actuated locking pin that is movable between a locked position where said pin extends into the opening of said locking tongue and effectively holds said handle in a closed position and an unlocked position where said pin is retracted from said opening and said handle is free to be moved between said opened and closed positions; an array of control switch means operatively connected in said electrical circuit for actuating said locking mechanism and causing said locking pin thereof to be moved from said locked position to an unlocked position in response to each of said array of control switch means being simultaneously actuated; said array of control switch means including a first control switch means operatively connected in said electrical circuit and actuated in response to said vehicle assuming a stationary condition and thereby assuring that said locking mechanism cannot be unlocked with respect to said handle unless the vehicle is stationary; a second manually actuated control switch means operatively connected in said electrical circuit and disposed within the hand reach access of the vehicle driver such that the driver can actuate the same, thereby assuring that said locking mechanism cannot be unlocked unless said second control switch means is actuated by said driver; and an override mechanism associated with said locking mechanism for allowing said locking mechanism to be disassociated from said handle in order that said handle can be manually operated without regard to said safety actuating control system, said override mechanism including mounting means for supporting said locking mechanism thereon and means for moveably mounting said mounting means between operative and inoperative positions with respect to said handle when disposed in the locked position.

4,200,168

APPARATUS FOR ROLL-STABILIZING A VEHICLE

William C. Moog, Hillcrest Rd., East Aurora, N.Y. 14052

Filed Apr. 7, 1978, Ser. No. 894,475
Int. Cl.[2] C60R 27/00
U.S. Cl. 180—282 **8 Claims**

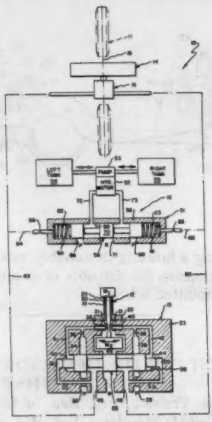
1. Apparatus for roll-stabilizing a vehicle, comprising:

sensing means mounted on said vehicle for sensing the application of an overturning moment to said vehicle in terms of said vehicle's lateral acceleration and in terms of said vehicle's angular acceleration about a roll axis;

static balance means operable in response to said sensing means for shifting a weight transversely of said vehicle to correct a static imbalance of said vehicle, said static balance means including filter means operatively arranged to filter out high frequency variations in the parameters sensed by said sensing means;

an inertia wheel mounted on said vehicle for rotation about an axis parallel to the longitudinal axis of said vehicle; and

motor means mounted on said vehicle and operable in response to said sensing means for accelerating said inertia wheel in the appropriate angular direction to cause said



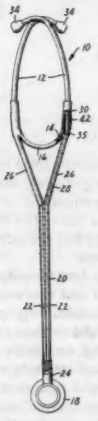
inertia wheel to exert a reaction torque on said vehicle to oppose a dynamic overturning moment applied thereto.

4,200,169

STETHOSCOPE

Robert D. MacDonald, III, Stillwater, and Frederick W. Nelson, Cottage Grove, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Oct. 16, 1978, Ser. No. 951,375
Int. Cl.[2] A61B 7/02
U.S. Cl. 181—131 **10 Claims**



1. In a stethoscope comprising a pair of elongated rigid ear tubes each having an upper end suitably curved for insertion into the ear of the wearer, a lower end for attaching to flexible tubing and a central passageway extending lengthwise therethrough having a diameter, at least one chestpiece having an adapter for attachment to flexible tubing, flexible tubing acoustically connecting the at least one chestpiece to said ear tubes and spring means attached to said lower end of said ear tubes for biasing said ear tubes toward each other, the improvement wherein said flexible tubing defines separate twin passages extending between the at least one chestpiece and said ear

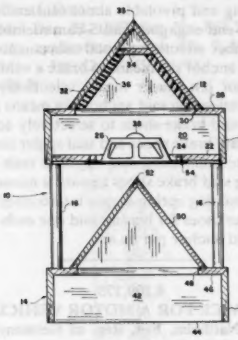
tubes, each of said passages being connected to and continuous with one of said ear tube passageways by a leak-free junction and the diameter of said passages being equal to the diameter of said ear tube passageways thereby forming twin air columns having constant diameters extending between the at least one chestpiece and the upper ends of said ear tubes.

4,200,170

PYRAMID SPEAKER ASSEMBLY

John H. Williams, Jr., 4865 S. Lawton, Tulsa, Okla. 74107

Filed Aug. 29, 1977, Ser. No. 828,316
Int. Cl.[2] H05K *5/00;* **A47B** *81/06*
U.S. Cl. 181—155 **4 Claims**



1. A speaker assembly comprising a base member having one end thereof open and an aperture provided in the opposite end thereof, a pyramidal shaped housing member secured to the base member in the proximity of the aperture and having one end closed and the opposite end open to the aperture, a second base member secured in spaced relation to the first base member whereby the housing member is interposed therebetween, said second base member having apertures provided in the opposite ends thereof, a second housing member secured to the outer end of the second base member in the proximity of the respective aperture therein and having one end closed and the opposite end open to said respective aperture, and speaker means secured to the inner end of the second base member and disposed in the aperture of said inner end thereof.

4,200,171

END CAP AND SUSPENSION MEANS FOR ACOUSTICAL CEILING BAFFLE

Merritt W. Seymour, Sylvania; Barry R. Wyerman, Reynoldsburg, and Gary R. Steffy, Columbus, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 26, 1978, Ser. No. 973,310
Int. Cl.[2] E04B *5/52*
U.S. Cl. 181—287 **5 Claims**

1. For use with inverted T-bar ceiling grid systems for mounting ceiling panels, an acoustical ceiling baffle and suspension clip kit comprising:

(a) an acoustical ceiling baffle including a fibrous board grooved and folded to provide two thickness of the board and a pair of end caps mounted respectively over opposite end portions of the folded board, each of the end caps having a blade portion extending from an inner side of an end wall portion thereof between the two thicknesses of the board and having an aperture in an upper wall portion thereof; and

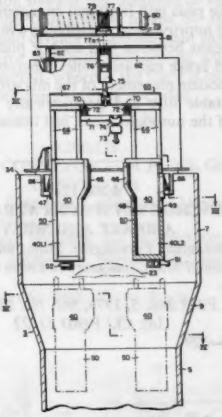
(b) a pair of suspension clips each including a generally U-shaped body portion having a bight portion and a pair of opposite leg portions, a rod portion depending from the bight portion and having a barb portion on a lower end portion thereof receivable in one of the end caps through the aperture in the upper wall portion, a pair of upper cantilever portions extending inwardly respectively from free end portions of the leg portions and overlapping the head portion of an inverted T-bar of a ceiling grid system when the clip is in use, and a pair of interlockable lower cantilever portions extending inwardly respctively from the leg portions and interlocking with each other when the clip is in use to maintain the upper cantilever portions in overlapping relationship with the head portion of the inverted T-bar.

4,200,172

RADIATION SHIELDED MOVABLE WORK STATION APPARATUS

Robert E. Meuschke, Pittsburgh; Harry N. Andrews, Murrysville Boro, and Anthony A. Massaro, Jr., Export, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,531
Int. Cl.[2] E04G *23/02;* **G21F** *1/00, 7/00*
U.S. Cl. 182—46 **6 Claims**



1. Work station apparatus for use in an opened-top steam generator shell of a nuclear power plant,

radiation shielded enclosure means for working personnel, having radiation-protective glass windows and holes for observation and manipulation of tools,

swivel means suspending said enclosure means with freedom for turning movement about a vertical axis,

crane means for disposition atop said opened-top shell to raise and lower the aforesaid enclosure-means-supporting swivel means, and

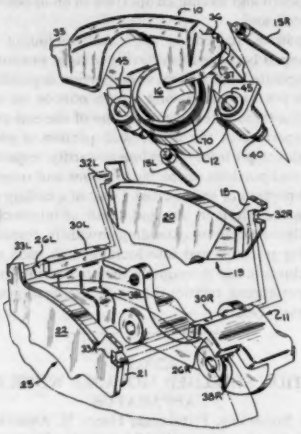
turning means operable from said enclosure means when suspended within said sheil, to effect the aforesaid turning movement.

4,200,173

SLIDING CALIPER DISC BRAKE

Anthony C. Evans, Westland; Karl Goering, Northville, and Kurt H. Rinker, Ann Arbor, all of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Filed Aug. 1, 1978, Ser. No. 928,471
Int. Cl.² F16D 65/02
U.S. Cl. 188—73.3 **6 Claims**



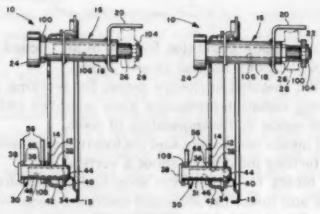
4. In a disc brake having a rotatable disc, an inboard and outboard frictional surface thereon, an anchor plate adapted to support an inboard and outboard brake pad assembly for frictional engagement with said inboard and outboard rotatable disc frictional surfaces respectively, and caliper means straddling said inboard and outboard brake pad assemblies for forcing said brake pads into frictional engagement with said rotatable disc, the improvement comprising a mutually cooperative geometry means between said anchor plate and said inboard and outboard brake pad assemblies whereby said anchor plate will accommodate placement of the inboard brake pad inboard of said rotatable disc and geometrically interfere with the placement of the outboard brake pad inboard of said rotatable disc.

4,200,174

CAM AND ANCHOR PIN SPACER ARRANGEMENT FOR A BRAKE ASSEMBLY

Dennis A. Borugian, Farmington Hills, and Gunnar Baltare, Livonia, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jun. 5, 1978, Ser. No. 912,271
Int. Cl.² F16D 51/22
U.S. Cl. 188—329 **9 Claims**



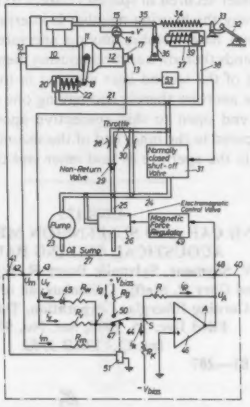
1. A brake assembly for a vehicle comprising a stamped spider member, an air chamber mounting bracket assembly rigidly fixed to one end of said stamped spider member, a cam shaft supported in said air chamber mounting bracket assembly and having an S-cam member affixed to one end thereof, said S-cam member being secured to said cam shaft for rotational movement about the longitudinal axis of said cam shaft, cam spacer means selectively locatable at spaced apart locations on said cam shaft for adjusting the longitudinal position of said cam shaft and said S-cam relative to said air chamber mounting bracket assembly to adjust the relative position of said S-cam and said spider member, an anchor pin means supported on said spider member in a position diametrically opposite from said one end of said spider member on which said air chamber mounting bracket assembly is secured, said anchor pin means being supported in a cantilevered fashion at one end thereof by said spider member, a pair of brake shoes, each of which has one end engaging and pivotable about said anchor pin means and an opposite end engaging said S-cam member, rotation of said S-cam member effecting pivotal movement of said brake shoes about said anchor pin means to brake a vehicle associated therewith, anchor pin spacer means selectively locatable at spaced apart locations on said anchor pin means and engaging said one end of said brake shoes to selectively adjust the relative position of said brake shoes and said spider member, return spring means interconnecting said opposite ends of said brake shoes for biasing said brake shoes toward a nonactuating position and shoe retaining spring means interconnecting said one ends of said brake shoes for biasing said one ends of said brake shoes against said anchor pin means.

4,200,175

CONTROL DEVICE FOR A MOTOR VEHICLE CLUTCH

Heinrich Dick, Nattheim, Fed. Rep. of Germany, assignor to Voith Getriebe KG., Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,830
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1976, 2657524
Int. Cl.² F16D 23/12
U.S. Cl. 192—0.033 **12 Claims**



1. Apparatus for controlling the operation of a clutch of the type which selectively couples a vehicle engine to a gear changing mechanism, said apparatus comprising:

(A) clutch control means for moving said clutch between an engaging and disengaging position as a function of a control signal applied thereto;

(B) control circuit means for generating said control signal as a function of the rotary speed of said engine and the speed of said vehicle, said control circuit to vary said control signal during each engagement of said cluth as a function of two components:

(1) a first component which initially varies as a substan-

tially linear function of the speed of the vehicle and thereafter varies as a positive exponential function of the speed of the vehicle; and

(2) a second component which varies as a substantially linear function of the speed of said engine, said first and second components varying in a direction which drives the clutch further into engagement for increasing vehicle and engine speeds, respectively.

4,200,176

CLUTCH ASSEMBLY

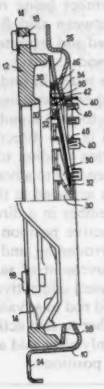
Pierre Courbot, Villiers le Bel, France, assignor to Societe Anonyme DBA, Paris, France

Filed Dec. 22, 1977, Ser. No. 863,271

Claims priority, application France, Jan. 7, 1977, 77 00331

Int. Cl.[2] F16D *13/44*

U.S. Cl. 192—89 B **7 Claims**



1. A clutch assembly comprising:

a pressure plate;

an annular cover rotationally connected to the pressure plate and capable of being fixed by its outer periphery to a flywheel;

a resilient annular diaphragm comprising an outer peripheral portion and a central portion formed of radial fingers which are separated by open slots and which are capable of being axially stressed by operating means so as to shift the pressure plate axially away from the flywheel;

fulcrum means provided between the diaphragm and the cover to pivotably mount said diaphragm on said cover;

said fulcrum means comprising an annular element having an annular portion bearing on that face of the diaphragm which is remote from the cover, and tabs extending axially from said annular portion through apertures facing them in the diaphragm and cover;

each said tabs defining at least one axial abutment capable of retracting resiliently during installation so as to engage that face of the cover remote from the diaphragm after predetermined axial stressing of the annular element;

a resilient lug projecting from each tab to define said abutments; and

an opening provided in each tab and capable to house the corresponding lug during installation of the annular element.

4,200,177

DRIVING MECHANISM FOR DRIVING MOVING HANDRAIL

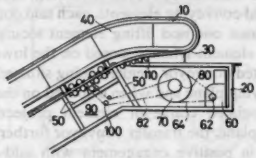
Yoshihiko Sato, Katsuta, and Masayuki Kubota, Nakaminato, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 5, 1977, Ser. No. 839,448

Claims priority, application Japan, Oct. 13, 1976, 51-121888; Oct. 20, 1976, 51-124846

Int. Cl.[2] B65G *15/00*

U.S. Cl. 198—335 **24 Claims**



1. A driving mechanism for driving a movable handrail comprising:

guiding rollers on which said moving handrail runs;

means for rotatably and stationarily supporting said guiding rollers;

driving rollers disposed to confront said guiding rollers with said moving handrail interposed therebetween, so as to drive said moving handrail by means of frictional force exerted between said driving rollers and said moving handrail;

means for rotatably supporting said driving rollers and capable of moving relatively to said means for supporting said guiding rollers; and

transmission means for transmitting driving power to said driving rollers, said transmission means being arranged so as to displace said means for supporting said driving rollers in a direction toward said handrail so that a tension generated by the transmission means by the frictional force between said driving rollers and said handrail acts to increase the force at which said driving rollers contact said moving handrail, whereby the force is increased only when the driving mechanism is operated.

4,200,178

TRANSFER CONVEYOR FOR PIECE GOODS CONVEYORS

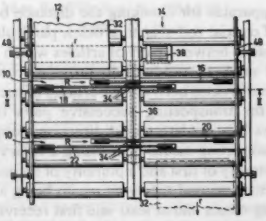
Rolf Gunti, Laufen, Switzerland, assignor to Masyc A.G., Munchenstein, Switzerland

Filed Apr. 19, 1978, Ser. No. 897,707

Claims priority, application Switzerland, Apr. 19, 1977, 4841/77

Int. Cl.[2] B65G *37/00, 47/34*

U.S. Cl. 198—372 **7 Claims**



1. A transfer conveyor suitable for the optional transfer of piece goods from a first roller track conveyor to a second, adjoining, parallel and co-planar roller track conveyor, said transfer conveyor comprising at least three endless flexible

filamentary conveyor elements, reversible guiding means for guiding said conveying elements around respective paths, each said path including an upper conveying run and a lower return turn, said upper runs being straight, being disposed below but closely adjacent a predetermined plane and being of the same length, said conveying runs extending substantially parallel with each other and wherein two of the transfer conveying runs extend between like lateral sides of the two roller track conveyors and the third transfer conveying run extends between the remaining like lateral sides of said roller track conveyors, the transfer conveyor including lifting elements secured to said conveying elements, each said conveying element having at least one said lifting element secured thereto, each said lifting element when disposed on the lower return run of the associated conveyor element being situated entirely below said conveying plane and when disposed on the conveying run of the associated conveyor element projecting above said conveying plane, the transfer conveyor further including driving means in positive engagement with said conveying elements whereby said conveying elements can be driven at the same linear speed, such that during driving of said elements by said driving means, the respective lifting elements rise above the conveying plane simultaneously.

4,200,179

APPARATUS FOR CHANGING THE DISTANCE BETWEEN PAIRS OF COAXIAL CIGARETTES OR THE LIKE

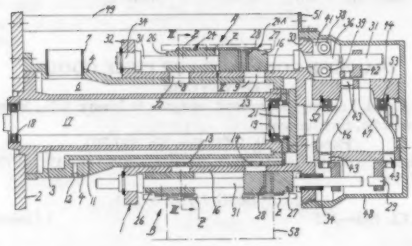
Werner Hinz, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,571

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655790

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—458 **15 Claims**



1. Apparatus for changing the distance between successive pairs of coaxial rod-shaped articles, particularly for increasing the distance between pairs of articles which constitute or form part of smokers' products to provide room for insertion of additional articles between the articles of each pair, comprising means for transporting successive pairs of coaxial articles sideways in a predetermined direction along an endless path, said transporting means comprising a rotary conveyor including a plurality of first and a plurality of second article receiving means, each second receiving means being aligned with a first receiving means and at least said first receiving means forming a plurality of groups, said transporting means further including a mobile holder for each of said groups; and means for moving said holders substantially transversely of said direction during travel of said holders along a predetermined portion of said path.

4,200,180

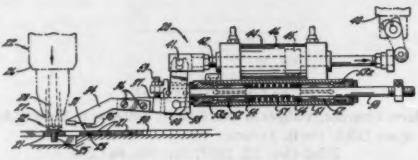
MECHANISM FOR FEEDING WORKPIECES

Paul H. Dixon, Belvidere, Ill., assignor to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Jul. 10, 1978, Ser. No. 923,096

Int. Cl.[2] B65G *25/02*

U.S. Cl. 198—487 **8 Claims**



1. Mechanism for advancing a workpiece along a generally straight path from a first station to a second station, said mechanism comprising a member for engaging and advancing the workpiece, a rod extending generally parallel to said path and mounted for lengthwise reciprocation through advance and retract strokes, said member being mounted on said rod to move with said rod between said first and second stations when said rod is advanced and retracted and being mounted to move between active and inactive positions, said member engaging the workpiece when in said active position and releasing the workpiece when in said inactive position, a reversible actuator connected to said member, said actuator being operable when actuated in one direction to apply a force to said member in a direction tending to move said member to said active position and tending to advance said rod, said actuator being operable when actuated in the opposite direction to apply a force to said member in a direction tending to move said member to said inactive position and tending to retract said rod, and means surrounding and gripping said rod and frictionally retarding movement of said rod as said actuator moves said member between said active and inactive positions, said means permitting said rod to advance only after said actuator has moved said member to said active position and permitting said rod to retract only after said actuator has moved said member to said inactive position.

4,200,181

CONVEYOR SYSTEMS FOR CIGARETTES AND SIMILAR ROD-LIKE ARTICLES

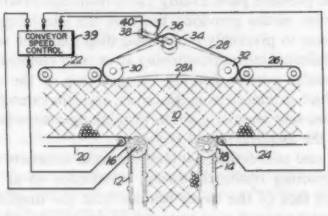
Peter A. Clarke, London, England, assignor to Molins Limited, England

Filed May 11, 1976, Ser. No. 685,535

Claims priority, application United Kingdom, May 16, 1975, 20962/75

Int. Cl.[2] B65G *43/08*

U.S. Cl. 198—572 **15 Claims**



1. A conveyor system for cigarettes, including means defining a junction zone, at least two conveyors each having one end adjacent to the junction zone and arranged to carry cigarettes into or from the junction zone, a moving sensor band which has an operative section partly defining the junction

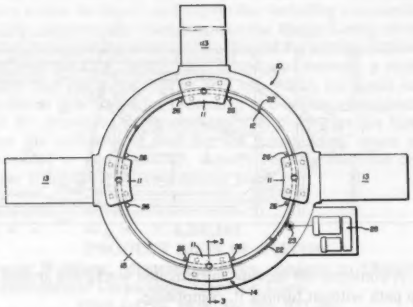
zone, support means for supporting said sensor band with a predetermined tensioning force so as to be capable of flexing outwardly of the junction zone against said tensioning force under the pressure of cigarettes in the junction zone, the sensor band being driven so as to assist the movement of cigarettes through the junction zone, and monitoring means responsive to the amount of outward flexing of the operative section of the sensor band for controlling the speed and/or direction of movement of one of the conveyors, the monitoring means comprising a movable pulley around which the sensor band passes, means for urging the movable pulley in a direction such as to tension the operative section of the sensor band on said support means so as to apply said tensioning force thereto, and means responsive to movement of the pulley for controlling the speed and/or direction of movement of one of the conveyors.

4,200,182

METHOD OF MACHINING

Andrew V. Siarto, West Bloomfield, Mich., assignor to Siarto Machine & Tool Co., Inc., Novi, Mich.

Division of Ser. No. 801,181, May 27, 1977, abandoned. This application Sep. 14, 1978, Ser. No. 942,221
Int. Cl.[2] B23P *23/00*
U.S. Cl. 198—617 **2 Claims**



1. In a method of machining, wherein an annular gear supportingly engages a plurality of pallets each carrying a part to be machined and rotation of the gear presents each part to successive machining stations located peripherally about the gear, the improvement of accurately positioning each pallet at its machining station by the steps of:

(1) rotating the gear to roughly align each pallet with a machining station;

(2) substantially simultaneously (a) halting the gear and (b) lowering the gear;

(3) during the performance of Step (2), (a) depositing each pallet on a supporting means located adjacent the aligned machining station and (b) disengaging each deposited pallet from the gear; and

(4) adjusting each pallet on its supporting means independently of said gear into accurate alignment with the aligned machining station; and

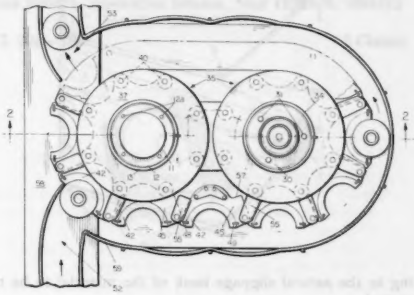
(5) clamping the accurately aligned and positioned pallet at its machining station independently of the gear.

4,200,183

APPARATUS FOR MOVING GLASS CONTAINERS THROUGH A SERIES OF INSPECTION POSITIONS

Darius O. Riggs, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 25, 1978, Ser. No. 936,973
Int. Cl.[2] B65G *19/02*
U.S. Cl. 198—648 **5 Claims**



1. Apparatus for indexing containers from station to station of a plural station ware inspection machine, comprising:

a pair of spaced-apart, vertically extending hubs;

disc means connected to each said hub, said discs being in the same horizontal plane;

index drive means connected to one of said hubs for indexing said one hub about its axis;

a plurality of bottle-engaging pocket members;

said pocket members comprising generally C-shaped members pivotally connected to each other;

said C-shaped members being formed with a groove on the inside of the "C;"

interchangeable C-shaped inserts releasably mounted in said members and having a tongue on the exterior thereof adapted to fit in the groove of said members;

spring-biased retaining means for holding said inserts in said members; and means interconnecting said pocket members in the form of an endless chain, said chain of pocket members encompassing said pair of spaced discs and being supported thereby, whereby indexing of one disc indexes the other disc through the chain of pockets.

4,200,184

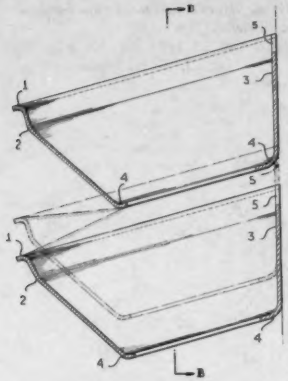
BOTTOMLESS BUCKET FOR HOIST CONVEYORS

Jean Tripoteau, 40, rue du Drouillard, 44620 La Montagne, France

Filed May 9, 1978, Ser. No. 904,279
Int. Cl.[2] B65G *17/36*
U.S. Cl. 198—713 **8 Claims**

1. A bottomless bucket adapted for use with vertical conveyors for transporting granular, farinaceous, pulverulent, fluidized and like materials comprising a generally truncated pyramid body defined by a front wall, a rear wall and a pair of opposite spaced side walls, the walls of said body having upper and lower terminal edge portions, a major portion of said front and side walls each being of a first predetermined angle to a plane taken through said upper terminal edge portions, upper wall portions of said front and side walls between the terminal edge portions thereof and said major portion being each of a second predetermined angle to a plane taken through said upper terminal edge portions which is greater than said first predetermined angle, and a portion of said rear wall upper terminal edge portion being below said front and side wall

upper terminal edge portions thereby forming a cut-out enabling the positioning pitch of the bucket to be varied accord-



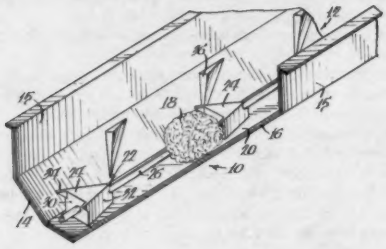
ing to the natural slippage bank of the material to be transported.

4,200,185

HARPOON TYPE CONVEYOR CONTROL SYSTEM

Melvin Van Nocker, Kalamazoo, and Charles R. Larson, Bellevue, both of Mich., assignors to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed May 25, 1978, Ser. No. 909,199
Int. Cl.[2] B65G *25/00*
U.S. Cl. 198—718 **12 Claims**



1. A control system for a harpoon-type conveyor for the transportation of swarf-like material, said conveyor being of the type including a conveyor trough having an upstream end and a downstream end, harpoon means in said trough adapted to be reciprocably moved in a forward direction from an upstream position toward a downstream position and in a rearward direction from a downstream position towards an upstream position while urging the swarf-like material downstream along said trough, and a pressurized fluid circuit for effecting said reciprocating movement of said harpoon means including fluid motor means coupled to said harpoon means and selectively operable to effect said reciprocating movement thereof, a source of pressurized fluid and valve means actuatable to selectively couple pressurized fluid in said fluid circuit to said fluid motor means to effect said selective operation thereof and said resulting reciprocating movement of said harpoon means; in which the pressure of said fluid increases in response to stoppage of movement of said harpoon means in one of said directions while said valve means is actuated to effect movement of said harpoon means in said one direction; said control system comprising:

valve control means selectively energizable to actuate said valve means to effect movement of said harpoon means by selectively coupling said pressurized fluid to said fluid motor means;

pressure sensitive means for sensing the fluid pressure in a portion of said fluid circuit and operable in response to a selected value of increased fluid pressure therein;

means responsive to operation of said pressure sensitive means for deenergizing said valve control means to thereby deactuate said valve means and terminate the operation of said fluid motor means to move said harpoon means in said one direction;

additional means responsive to operation of said pressure sensitive means for energizing said valve control means to effect movement of said harpoon means in the other of said directions;

timing means energized concurrently with energization of said valve control means for defining a normal operating time period of selected duration; and

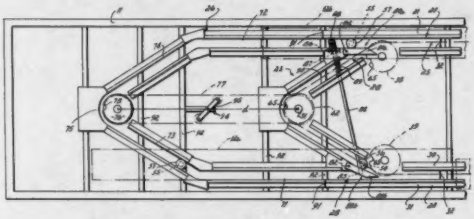
means energized in response to operation of said pressure sensitive means prior to the expiration of said normal operating time period for initiating a jam cycle to effect unjamming of said harpoon means.

4,200,186

TRANSFER CONVEYOR FOR ELONGATED WORKPIECES

Carl E. Boettcher, Evansville, Ind., assignor to AIMAC, Inc., Evansville, Ind.

Filed May 15, 1978, Ser. No. 905,402
Int. Cl.[2] B65G *17/48*
U.S. Cl. 198—800 **15 Claims**



1. A conveyor for moving an elongated workpiece around a loop path without turning it, comprising,

a track in the form of a main loop which includes main runs and main loop ends joining the main runs,

the track also including auxiliary ends which are offset from the main loop ends, the auxiliary ends and the main loop ends meeting the main runs at junctions,

a carrier for the workpiece, the carrier having first and second followers engaging the track to follow the same,

an endless loop drive extending around the main loop for propelling the carrier,

said drive engaging said carrier through two drive connections adjacent the respective followers, each of which is releasable from the drive,

the carrier being driven by whichever of said connections engages the drive,

a switch at the downstream junction of each main run for connecting the main run to the respective end of the main loop or alternatively to the respective auxiliary end, and

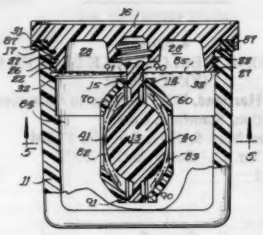
a switch operator for each switch, the operator being responsive to the position of a carrier to operate the switch after a first follower on a carrier coming from the respective main run has passed the switch but before the second follower of the carrier has passed that switch, to direct one follower of the carrier to move on an end of the main loop and the other follower to move on the auxiliary end.

4,200,187

LENS CASE WITH OPPOSITELY HINGED BASKETS

Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Hanover Park, Ill.

Filed Oct. 27, 1978, Ser. No. 955,394
Int. Cl.[2] A45C 11/00; B08B 3/04
U.S. Cl. 206—5.1 10 Claims



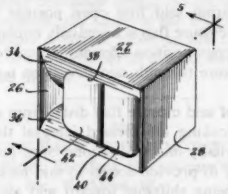
1. A lens case for supporting a pair of contact lenses in a disinfecting liquid solution, which upon being heated to an elevated temperature, effects sterilization or disinfecting of the lenses, said lens case comprising: a generally cylindrical container for the liquid and having an internal thread about its periphery at its open end; lens holding means arranged to confine the lenses to be sterilized; and a cap having a maximum diameter dimension for overlying the open end of said container, means for providing sealing engagement between said container and said cap; and means attaching said lens holding means to the cap with the lenses confined therein for disposition within the liquid; said cap further including a circumferentially downwardly extending, annular flange having an external thread on the outer surface thereof for mating with said container internal thread; said flange also forming a recess within said cap to provide an area into which the liquid may expand as it is heated for protecting said sealing engagement, and for providing an air pocket for displacing excess liquid from the container as said cap and lens holding means are assembled to said container, thereby insuring that said container is not filled above a desired level.

4,200,188

PRODUCT DISPLAY CARTON

George Webinger, Minneapolis, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 24, 1978, Ser. No. 927,382
Int. Cl.[2] B65D 5/50
U.S. Cl. 206—45.14 5 Claims



1. A display carton made from a foldable sheet material for one or more products comprising:

a first pair of wall panels;

a second pair of wall panels connecting the panels in said first pair to form a generally rectangular tube;

a pair of retaining panels only to corresponding edges of the panels of said first pair of wall panels and extending into the interior of the rectangular tube, each of said retaining panels being generally rectangular and substantially the same length as and wider than the panel from which it extends, each retaining panel having at least one product-receiving, cutout formed therein.

4,200,189

GRAMMOPHONE RECORD SLEEVE

Gabriella Hagelberg, Stockholm, Sweden, assignor to Bengt Petersson New Products Investment AB, Goteborg, Sweden

Filed Aug. 7, 1978, Ser. No. 931,662
Claims priority, application Sweden, May 11, 1978, 7805372
Int. Cl.[2] B65D 85/00
U.S. Cl. 206—313 2 Claims

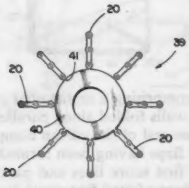
1. Grammophone record sleeve made of a thin material, such as paper or cardboard, and comprising a first section and a second section, said sections being connected to each other and having such a size and shape that they are substantially adapted to cover a grammophone record intended to be stored between said sections, said sections at least on their insides being coated with an electrically conducting layer, said electrically conducting layer being connected with at least one surface of an electrically conducting layer on the outside of the sleeve, said sections being connected only along one edge, and the second section at one edge opposed to said connection edge being provided with a third section which in the storing condition of use is in a position between the two sections, the third section having a limited extension from the edge connecting the second section so that it covers the grammophone record only at an edge portion of the same, with the inside of the first and the second section and the third section on its outside, being coated with the electrically conducting layer.

4,200,190

BOBBER STOPPER

Raymond K. Tyson, 406 N. Carr Rd., Plainfield, Ind. 46168

Filed Feb. 28, 1979, Ser. No. 16,009
Int. Cl.[2] A63D 55/00
U.S. Cl. 206—315 R 11 Claims

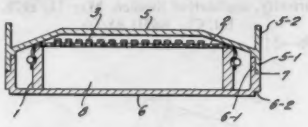


1. A bobber stopper for use with fishing line and a slide bobber wherein the fishing line is freely movable through said slide bobber until said bobber stopper is encountered, said bobber stopper being selectively positionable along said fishing line and remaining where positioned and being small enough to pass through the line apertures of fishing reels and comprising: a substantially flat, flexible body member having a pair of oppositely disposed end apertures extending therethrough and a third aperture disposed between said pair of oppositely disposed end apertures.

4,200,191
CONTAINER FOR STORAGE OR TRANSPORTATION OF SEMICONDUCTOR CHIPS

Yoshiaki Nakamura, and Takaharu Abe, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 17, 1978, Ser. No. 934,529
Claims priority, application Japan, Aug. 19, 1977, 52-99702
Int. Cl.[2] B65D *73/02*
U.S. Cl. 206—328 14 Claims

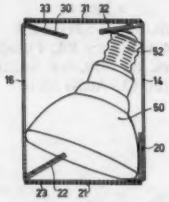


1. A container of semiconductor chips, comprising:
a support ring having an upper edge portion;
a plastic film carrying said semiconductor chips thereon and supported by said support ring with said plastic film overlying said outer edge portion;
a lower casing member adapted to receive said support ring:
an upper casing member matable with said lower casing, said upper casing member having an inner face of a frustoconical shape, a sloping portion of said inner face being in contact with said plastic film along said outer edge portion of said support ring in such a manner that said support ring is maintained in a predetermined orientation in said casing, said upper casing member being so formed that it does not contact any of said semiconductor chips.

4,200,192
CARTON CONTAINING AN ARTICLE PACKAGED THEREIN

Franciscus M. Klomp, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1978, Ser. No. 884,975
Claims priority, application Netherlands, May 11, 1977, 7705187
Int. Cl.[2] B65D *85/42*
U.S. Cl. 206—418 3 Claims



1. A package comprising a rectangular cross-section carton having four side walls folded along parallel first score lines; a first closure at one end of the carton composed of four flaps, each of said four flaps having been formed by a second score line crossing the first score lines and parallel respective first score line extensions of said first score lines, all four of said flaps having been respectively folded inwardly along their respective second score lines, two of said four flaps being oppositely located and each of such two oppositely disposed flaps having oblique third score lines respectively extending from the points of intersection of the first score lines with the second score line, said two oppositely disposed flaps being folded into the carton with at least one of said two oppositely disposed flaps lying in contact with its respective side wall; an article enclosed within the carton and trapping said one oppositely disposed flap between the article and said side wall, the other two of said four flaps being free of score lines and overlapping each other, said trapping of such one oppositely disposed flap rendering said enclosed article inaccessible directly from the outside through said first closure; and a second closure for the other end of the carton, said second closure being so formed as also to render the enclosed article inaccessible therethrough directly from the outside.

4,200,193
EASY OPENING, RECLOSEABLE BLISTER CARD CONTAINER

Daniel J. Boyle, Hartland, Wis., assignor to Champion International Corporation, Stamford, Conn.

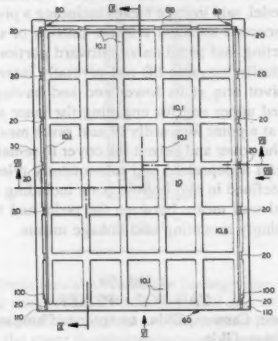
Filed Mar. 5, 1979, Ser. No. 17,604
Int. Cl.[2] B65D *75/36, 75/58*
U.S. Cl. 206—461 10 Claims

1. A container provided with a closable opening therein, comprising:
an enclosure including a plastic blister having first, second, third and fourth edges defining the perimeter thereof,
said enclosure further including a rigid unitary card fixedly attached to marginal areas of said blister along essentially the entire length of said first, second and third edges of said blister whereby to define a wall of said enclosure,
said card being provided with a continuous opening therein extending from one side of said fourth edge of said blister to the opposite side of said fourth edge whereby to define a first open portion in said card in registration with said blister to allow access to said enclosure and a second open portion in said card contiguous with said first open portion and adjacent said blister, peripheral portions of said card essentially completely circumscribing said continuous opening whereby to provide a rigid border therearound,
said card having a closure flap integral therewith which is swingable about a fold line in said card from a closed position covering said first open portion in said card wherein said closure flap is essentially coplanar with said card and an open position allowing access to the interior of said enclosure through said first open portion of said card,
one extremity of said closure flap distal from said fold line including a locking tab formed integral therewith and extending partially into said second open portion of said card whereby to provide access to said locking tab, said locking tab being shiftable toward and away from the plane of said flap about a crease line in the latter,
said fourth edge of said blister defining a lock edge extending transverse to said closure flap and in registration with said locking tab when said closure flap is in said closed position thereof,
said locking tab being shiftable to a position on one side of said lock edge opposite said closure flap whereby said lock edge is interposed between portions of said closure flap and said locking tab to lock said closure flap in said closed position thereof.

4,200,194
NESTABLE BASKET-TYPE CONTAINERS

Walter Zeischegg, Neu-Ulm, and Bernd Brüssing, Ulm, both of Fed. Rep. of Germany, assignors to Hans Friedrich Hefendehl, Kierspe, Fed. Rep. of Germany

Filed Nov. 14, 1978, Ser. No. 960,729
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755858
Int. Cl.[2] B65D *21/04*
U.S. Cl. 206—507 8 Claims



1. A container comprising:

a flat base having upper and lower faces and an outer rectangular peripheral edge having a pair of substantially parallel main sides and a pair of substantially parallel minor sides bridging said main sides, said main sides and one of said minor sides together defining a U-shape;

an array substantially of said U-shape of generally parallel strips extending generally perpendicularly upwardly from said base and each having a lower end secured to said outer peripheral edge and an upper end, said strips each having a predetermined width measured parallel to said edge and a predetermined thickness measured perpendicular to said edge, said strips being generally equispaced at least along said main sides of said edge by a distance equal to at least said width; and

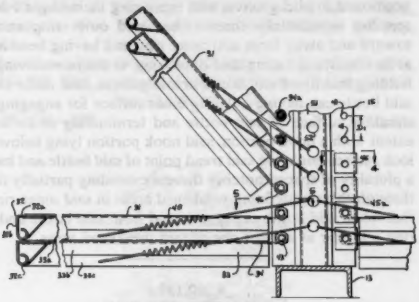
a flat rim having an inner edge of substantially said U-shape but larger in at least one direction parallel to said minor sides of said base than the corresponding portion of said peripheral outer edge of said base by a difference equal to at least twice said thickness, said upper ends being secured to said inner edge, said container being open parallel to said base at said minor side whereby two at least of said containers can nest within each other with the lower face of the upper container resting on the upper face of the lower container, the strips of the containers interleaved, and the upper container offset parallel to said major sides from the lower container to project from the open other minor side thereof.

4,200,195
STOCK RACK WITH PIVOTED TRAYS

Clarence H. Hager, Rockford, Ill., assignor to Modern Suspension Systems, Inc., Rockford, Ill.

Filed Dec. 18, 1978, Ser. No. 970,571
Int. Cl.[2] A47F *5/00*
U.S. Cl. 211—24 4 Claims

1. In a stock rack with pivoted trays of the type used in tire plants for transporting tire tread forming blanks, the stock rack having a pair of end upright supports and at least one intermediate upright support, and a plurality of superposed trays each mounted on the upright supports for pivotal movement about a horizontal axis adjacent a rear edge of the tray from a lowered position to a raised position, the improvement wherein each tray has at least two axially aligned rolled rim sections of substantially circular cross-section extending along the rear edge of the tray, said rolled rim sections being dimensioned to extend between adjacent ones of said upright supports and having adjacent ends spaced apart a distance to receive an intermediate one of upright supports therebetween, said end upright supports and said intermediate upright support each having a plurality of vertically spaced hinge rod receiving openings therein with respective ones of the openings in the end and intermediate upright supports being arranged in horizontally aligned sets, a plurality of hinge rods each having a

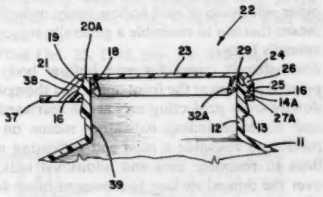


length to extend from one end support to the other end support and each extending through a respective one of the horizontally aligned sets of hinge rod receiving openings in the end and intermediate upright supports and through the axially aligned rim sections on the rear edge of a respective one of the trays, means securing the hinge rods against turning relative to upright supports, the rolled rim sections on the tray having an internal cross-section sufficiently larger than the hinge rod to loosely receive the hinge rod whereby the rolled rim sections on the rear edge of each tray turn on the hinge rod as the trays are moved between their lowered and raised positions.

4,200,196
BOTTLE TOP CLOSURE

Joseph E. Bashour, R.R. #3 Glynwood, Wapakoneta, Ohio 45895

Continuation-in-part of Ser. No. 851,139, Nov. 14, 1977, abandoned. This application Oct. 23, 1978, Ser. No. 952,443
Int. Cl.[2] B65D *41/48*
U.S. Cl. 215—253 5 Claims



1. In combination, a bottle and bottle cap, said bottle having a mouth defined by an annular upwardly extending lip portion, said lip portion having an inner and outer cylindrical surface and a top surface extending between said inner and outer cylindrical surfaces, said bottle having a shoulder surface flaring outwardly from the lowest point of said outer cylindrical surface and terminating at its radially outward extent at a tread point, said bottle having a lock surface extending radially inward from said tread point, said bottle cap having a top portion for covering the mouth of said bottle and inner and outer rings extending downwardly from said top portion to outermost points, said inner and outer rings being spaced at

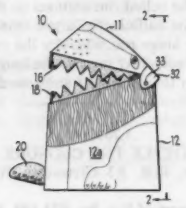
said top portion a distance slightly greater than the distance between said inner and outer cylindrical surfaces of said bottle thereby defining with said top portion a groove to receive said lip of said bottle, said outer ring extending generally perpendicularly downward from said top portion and said inner ring extending angularly from said top portion toward said outer ring so that said inner and outer rings are spaced at their lowermost points a distance slightly less than the distance between said inner and outer cylindrical surfaces so that said lip portion of said bottle is engaged by said inner and outer rings when positioned in said groove, said inner ring including a resilient member substantially thinner than said outer ring movable toward and away from said outer ring and having bead means at its lower end facing said outer ring to aid in receiving and holding said lip of said bottle in said groove, said outer ring of said bottle cap having a flaring inner surface for engaging said shoulder surface of said bottle and terminating at its lowest extent with a hook portion, said hook portion lying below said lock surface engaging said tread point of said bottle and having a plurality of spaced notches therein extending partially therethrough thereby defining weakened areas in said outer ring so that when said bottle cap is removed from said bottle and said ring will tear at at least one of said weakened areas.

4,200,197

ANIMATED TOY BOX

Burton C. Meyer, and Denise Gardner, both of Downers Grove, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 2, 1979, Ser. No. 18
Int. Cl.[2] B65D *43/20*; A63H *4/00, 13/00*
U.S. Cl. 220—263 **3 Claims**



1. A storage apparatus for storing toys and the like, comprising:

a hollow body having an open end for receiving toys, the outer side walls of said hollow body including indicating means thereon to resemble a generally torso portion of an animal's body;

a dome-shaped cover for said hollow body including a pointed portion at the front upper end thereof and a pair of downwardly projecting ears at the rearward end thereof, said cover including indicating means on the pointed portion to resemble a nose and indicating means on the flaps to resemble ears and additional indicating means over the domed surface to represent other facial features of an animal's head;

pivoting means on the downwardly projecting flaps of the cover pivotally mounting the cover on the body to open and close with respect to the upper end of said hollow body;

a plurality of downwardly projecting teeth around substantially the entire periphery of said cover opposite said flaps, said downwardly projecting teeth being formed of flexible material for deflecting inwardly when said cover is closed;

a plurality of upwardly projecting teeth around substantially the entire periphery of said open hollow body opposite said pivotal connection, said teeth being formed of flexible material for engaging the upper row of teeth when the cover is closed and deflecting inwardly as the teeth engage one another to provide a resilient seal between the body and cover;

a manually actuatable pedal supported for movement adjacent a lower portion of said body and projecting outwardly therefrom, said pedal including a bulbous type body and including indicating means representing paws and claws of an animal;

linkage means for interconnecting said foot pedal and said cover to pivotally open said cover away from the upper end of said body in response to downward pressure on said pedal, said linkage means including a pivot arm pivotally mounted adjacent a lower portion of said body and supporting said pedal on an outward portion thereof, and a vertically movable lift rod pivotally interconnected to said pivot arm at its lower end and having a generally rounded upper end for engaging the inner surface of the cover at a point forwardly of said pivot means to thereby open the cover and permit the cover to remain open when the pedal is depressed and subsequently released; and

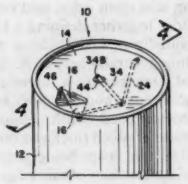
a recess defined in said hollow body including a plurality of internal wall means between the pedal and the cover for disguisingly mounting said linkage means.

4,200,198

CAN TOP OPENER

Allen D. West, Catoosa, Okla., assignor to Chinquapin Corporation, Catoosa, Okla.

Filed Nov. 6, 1978, Ser. No. 958,109
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **6 Claims**



1. In combination with a metal container having a cylindrical sidewall and a top end panel, the panel having an inner and outer surface, an opening means comprising:

a pouring tab scored in the top panel outlined by reduced thickness metal, the tab being adjacent the cylindrical sidewall;

an elongated opener strip having one end attached to the inner surface of the pouring tab at a point adjacent the can sidewall and the other end of the strip attached to the inner surface of the top panel at a point adjacent the can sidewall diametrically of the tab;

a pop hole tab scored in the top panel outlined by reduced thickness metal, the pop hole tab being adjacent the center of the panel and directly above said opener strip and intermediate the strip ends; and

an opener stick having the inner end affixed to the outer surface of said pop hole tab, the opener stick normally lying horizontally adjacent to the top panel outer surface with the outer end adjacent the cylindrical sidewall,

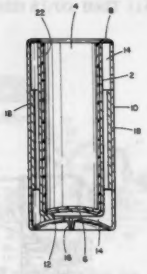
whereby the opener stick may be pivoted upwardly tearing said pop hole tab from the top panel providing an open aperture in the top panel, following which the opening stick may be downwardly displaced so that the inner end engages said opener strip and further downward displacement of the opener stick causes portions of said scored periphery of said tab to be torn from the top panel and the pouring tab hinged downwardly within the container providing a pouring opener.

4,200,199

VACUUM BOTTLE CONSTRUCTION

William A. Perkins, and William J. Tanner, both of Nashville, Tenn., assignors to Aladdin Industries, Incorporated, Nashville, Tenn.

Filed Sep. 1, 1977, Ser. No. 829,600
Int. Cl.[2] A47J *41/02*; B65D *25/14, 25/18*
U.S. Cl. 220—420 12 Claims



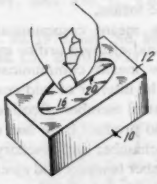
1. In a vacuum insulated container having sides, the bottom and open top constituted by an outer shell and an inner shell spaced from each other, joined at their tops to form the open top and with the space therebetween being substantially evacuated, and wherein said inner and outer shells are formed of a thin metallic material, said outer shell being so thin as to be collapsible inwardly under external ambient air pressure after said space has been evacuated, the improvement comprising: means in the evacuated space and in contact solely with the inner surface of said outer shell to strengthen at least the central vertical portion of said outer shell and to thereby prevent its collapse inwardly under external air pressure.

4,200,200

SHEET DISPENSING CARTON

Carl C. Hein, III, and Joseph J. Spitz, both of Neenah, Wis., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 700,551, Jun. 28, 1976, abandoned. This application Dec. 15, 1977, Ser. No. 860,888
Int. Cl.[2] A47K *10/42*
U.S. Cl. 221—48 7 Claims



1. A tissue-dispensing carton including wall portions, at least one of said wall portions including a tissue-dispensing opening covered by a continuous, single layer of an imperforate, uniaxially oriented, barrier type thermoplastic, polymeric film tensioned across said opening and adhered to said wall portion;

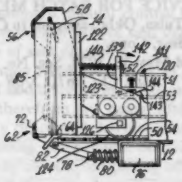
said film being uniaxially oriented to the extent that it exhibits tensile strength in the orientation direction that is substantially greater than the tensile strength in the direction perpendicular to the orientation direction, whereby said film splits along a line extending in the orientation direction to form a single, straight-line slit responsive to finger or fingernail pressure applied downwardly on its surface; said slit being defined by substantially abutting edges of said film between which edges said tissues may be dispensed and frictionally restrained; said film has a with-grain to cross-grain tensile strength ratio greater than 1.5 to 1 and a maximum elongation in both with-grain and cross-grain directions of no more than 150%, such that said single, straight line slit can be formed solely by said finger or fingernail pressure.

4,200,201

MACHINE HAVING MODULE WITH CARRIAGE FOR ADVANCING ROW OF ARTICLES

Robert J. Collins, Venice; Richard R. Stutsman, Mount Baldy, and Theodore C. Youngkin, North Hollywood, all of Calif., assignors to Rod Pierce and Associates, Marina del Rey, Calif.

Continuation-in-part of Ser. No. 762,113, Jan. 24, 1977, Pat. No. 4,134,520. This application Jun. 8, 1978, Ser. No. 913,560
Int. Cl.[2] B65G *35/04*
U.S. Cl. 221—129 24 Claims



1. A dispensing machine comprising:

a module in which articles to be dispensed can be arranged in a row;

releasing means disposed at one end of said module for releasing said articles sequentially upon actuation thereof;

a carriage movable along said module for advancing said articles toward said releasing means, said carriage including a non-rotatable structure and a drive wheel rotatably connected to said non-rotatable structure; and

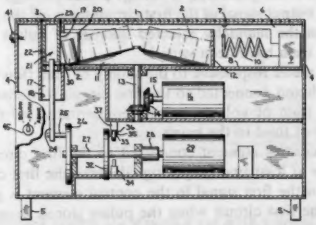
spring means mounted on and carried in its entirety by said carriage for driving said carriage toward said releasing means, said spring means being connected to said non-rotatable structure and said drive wheel to be wound by rotation of said drive wheel in one direction and unwound by rotation of said drive wheel in another direction.

4,200,202

BEVERAGE DELIVERY SYSTEM

Karl Schroeder, 3966 S. 44th St., Greenfield, Wis. 53220, and James A. Pappas, Glendale, Ariz., assignors to Karl Schroeder, Greenfield, Wis.

Filed Oct. 23, 1978, Ser. No. 953,616
Int. Cl.[2] F25D *25/04*
U.S. Cl. 221—150 R 7 Claims



1. A beverage container delivery device for use with an item of furniture having a horizontal top with an access opening therein, comprising:

(a) beverage container transport means disposed beneath the

said top for transporting a plurality of containers to a position laterally offset from and beneath the said top opening,

(b) a vertical wall forming a guide channel extending downwardly from said top opening and with said wall having a release opening therein facing said transport means,

(c) a beverage container handling piston disposed in said guide channel and with said piston having a top wall,

(d) and means to move said piston between a lowered and a raised position at said access opening,

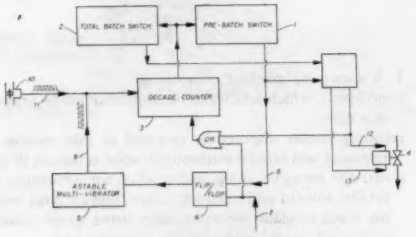
(e) said piston comprising means to block said release opening against passage therethrough of said containers between said transport means and said guide channel when said piston is in its said raised position.

4,200,203

CONTROL DEVICE FOR BATCH METERING SYSTEM

Jerald R. Rider, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 30, 1978, Ser. No. 910,322
Int. Cl.[2] B67D *5/08*
U.S. Cl. 222—14 **5 Claims**



1. An electrical network with which a control element is positioned to regulate a flow of fluid to a batch of the fluid, including,

a first circuit adapted to receive and store eletrical voltage pulses and generate a first output control signal when a first predetermined number of the stored pulses have been received,

a first manual selector means connected to the first circuit for manual predetermination of the number of pulses stored in the first circuit which will cause generation of the first output signal,

a generator of voltage pulses connected to the first circuit to generate a first input of a train of voltage pulses on the connection for storage in the first circuit,

a connection between the output of the first circuit and an input of the generator of voltage pulses through which the first output signal of the first circuit turns off the generator when the manually selected number of pulses from the first train have been stored,

a flow meter responsive to the supply of fluid flowing to the batch and connected to the first circuit to transmit a second train of voltage pulses representative of the actual flow of fluid to the batch,

and a control element connected to the first circuit to receive at least two output signals from the first circuit,

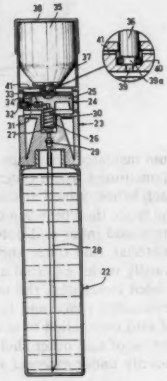
wherein the first signal to the control element is generated by the first circuit when the pulses stored from the first train and the pulses of the second train equal the total number of pulses required for each fluid batch and the second signal to the control element is generated by the first circuit when subsequent flow meter pulses equal the number of pulses originally stored from the first train.

4,200,204

DISPENSING CONTAINER WITH PRESSURE FLUID OPERATED DISPENSING PUMP

Daniel Bauer, Le Raincy; Jean-Paul Beck, Paris, and Gérard Braque, Mitry-le-Neuf, all of France, assignors to L'Oreal, Paris, France

Filed Mar. 6, 1978, Ser. No. 883,672
Claims priority, application France, Mar. 18, 1977, 77 08188
Int. Cl.[2] B67D *5/64*
U.S. Cl. 222—133 **21 Claims**



1. A dispensing container for storing and dispensing a liquid product, comprising a container vessel, a liquid product in said container vessel, and a pump which comprises:

(a) a dispensing chamber,

(b) ejection orifice means,

(c) one-way flow means communicating said dispensing chamber with said ejection orifice means,

(d) one-way flow means communicating said dispensing chamber with the interior of said container vessel,

(e) a movable control member effective to ensure introduction of the liquid product from said container vessel into the dispensing chamber and discharge thereof from said dispensing chamber towards said ejection orifice means by alternating displacement of said control member, and

(f) means for applying gas pressure from compressed gas to one end of said movable control member during a dispensing operation,

said gas pressure applying means comprising a pressurized reservoir, an ejection valve on said reservoir, and manually operable means for displacing said reservoir to actuate said valve to open during a dispensing operation,

and wherein a guide duct displaceably receives said pressurized reservoir,

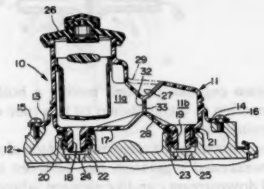
said pressurized reservoir having a part which projects outwardly from said guide duct, and said manually operable means comprises a cap slidably fitted on said guide duct for movement with respect to said guide duct to displace said reservoir relative to the guide duct under the action of pressure exerted on said cap by the user.

4,200,205

FLUID RESERVOIRS FOR TANDEM MASTER CYLINDERS

Masashi Ban; Tomio Tachino, both of Kariya, and Jiro Kizaki, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jul. 28, 1978, Ser. No. 929,178
Claims priority, application Japan, Jul. 30, 1977, 52-92051
Int. Cl.[2] B65D *85/00*; B60T *11/00*
U.S. Cl. 220—20.5 **3 Claims**



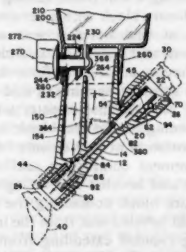
1. A fluid reservoir of resin material for a vehicle tandem master cylinder, comprising first and second fluid chambers for supplying fluid to first and second chambers, respectively, of said cylinder, said first and second fluid chambers each having upper, lower and side walls, said upper and lower walls of each said fluid chamber being tapered inwardly and said side-walls of each said fluid chamber being tapered inwardly forming a portion of each said fluid chamber into a substantially truncated pyramid-shape and to form a narrow waist portion of said reservoir including a common wall portion of said reservoir between said first and second fluid chambers, said common wall portion having an area smaller than the cross section of either of said fluid chambers; and an air conduit member integral with said upper walls of said first and second fluid chambers providing air communication between said fluid chambers, said air conduit member being U-shaped proximate said narrow waist portion to provide means for absorbing thermal deformation of said reservoir.

4,200,206

SHOWER ATTACHABLE DISPENSER

Charles R. Chase, 2253 W. St. Moritz La., Phoenix, Ariz. 85023, and Gerald F. Lantry, 2002 Ave. G., Council Bluffs, Iowa 51501

Filed Jan. 10, 1978, Ser. No. 868,414
Int. Cl.[2] B05B *07/28*
U.S. Cl. 222—144.5 **14 Claims**



1. A fluid dispenser comprising a flow body having a water main stream portion,

said body main stream portion having a main stream inlet adapted to be attached to a water conduit and having a main stream outlet to which a shower head is adapted to be connected,

said body main stream portion having a main stream passage interconnecting said inlet and outlet,

said body main stream portion having a dispensed fluids port extending therethrough from the upper side thereof to said main stream passage so that dispensed fluids can enter said main stream,

a fluid delivery manifold having an outer wall attached to and extending upwardly from said main stream portion of said flow body and surrounding said dispensed fluids port,

a reservoir assembly mounted on said delivery manifold and having reservoir means for fluid to be dispensed,

a valve means mounted on said reservoir assembly beneath said reservoir means,

said valve means having valve inlet means from said reservoir and having valve outlet means in communication with said fluid delivery manifold,

said valve means having a housing receiving a valve clogging member movable with respect to said valve housing and with respect to said reservoir means,

said valve means having a manual control means attached thereto and disposed exteriorly of said valve housing and on the outer side of said dispenser,

said reservoir assembly having a sliding fit with respect to said outer wall of said delivery manifold and being removable upwardly therefrom by being lifted substantially straight upwardly off of said delivery manifold,

said valve means being independent of said fluid delivery manifold and being capable of shutting off flow from said reservoir assembly through said valve outlet means,

said valve means being removable from said fluid delivery manifold simultaneously with said upward removal of said reservoir assembly from said fluid delivery manifold so that said reservoir means can be removed after said valve means has been shut off to minimize waste of dispensed fluid,

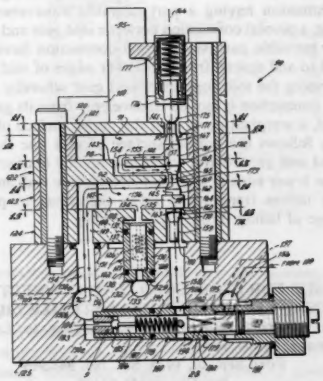
said reservoir assembly having filling means thereon in an upper portion thereof.

4,200,207

HOT MELT ADHESIVE FOAM PUMP SYSTEM

Larry D. Akers, and Charles H. Scholl, both of Vermilion, Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Feb. 1, 1978, Ser. No. 874,333
Int. Cl.[2] F04C *1/14, 15/04*
U.S. Cl. 222—190 **20 Claims**



7. A dispensing system for mixing a gas with a liquid and for pumping the resulting mixture to a dispenser comprising,

first and second stage gear pumps each having an inlet and outlet,

a passage for supplying said liquid to the inlet of said first stage pump,

means for delivering said liquid from the outlet of said first stage pump to the inlet of said second stage pump,

means for supplying said gas to said second stage pump for mixing therein with said liquid,

means for delivering said mixture of gas and liquid from said second stage pump to a dispenser, and

recycle means for at least partially returning said mixture from said second stage pump, through a recycle passage to said second stage pump when said dispenser is not dispensing all said mixture supplied to it from said second stage pump,

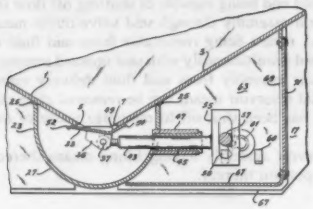
said recycle means connecting the outlet of said first stage pump with the inlet of said first stage pump, and connecting the outlet of said second stage pump with the inlet of said second stage pump, said liquid being recycled through said first pump and said mixture being recycled through said second pump.

4,200,208

PNEUMATIC HOPPER GATE

Robert L. Hassenauer, Wilmette, Ill., assignor to Evans Products Company, Portland, Oreg.

Filed Apr. 26, 1978, Ser. No. 900,132
Int. Cl.[2] B65G *65/62, 65/66*
U.S. Cl. 222—505 **8 Claims**



1. An outlet gate arrangement for a hopper having sloping side walls converging toward each other and spaced apart at their lower edges to define a discharge opening, a gate having an upper surface sealingly engageable with said side walls adjacent their opening-defining lower edges when said gate is closed, means maintaining said gate in constant engagement with the bottom surface of one of said side walls, a gate operating mechanism having a part movable transversely of said opening, a pivotal connection between said gate and said transversely movable part, said pivotal connection having its axis parallel to and spaced from the lower edges of said side walls and forming the sole support of said gate whereby when said pivotal connection is moved transversely from its gate-closing position, a marginal portion of the upper surface of said gate slidably follows the bottom surface of said one sloping side wall and said gate rotates about said pivotal connection away from the lower edge of the other sloping side wall and simultaneously moves transversely away therefrom to permit the discharge of lading through said opening.

4,200,209

DEVICE FOR STOPPERING AND CONNECTING A CONTAINER CONTAINING A STERILE LIQUID

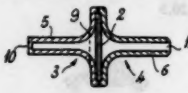
Georges Aguettant, Lyon, France, assignor to Laboratoire Aguettant, Lyons, France

Filed Sep. 26, 1978, Ser. No. 945,909
Int. Cl.[2] B65D *47/36*
U.S. Cl. 222—541 **8 Claims**

1. A device for stoppering and connecting a container containing a sterile liquid, comprising

two hollow cup-like elements aligned coaxially and sealed together along their peripheries in a fluid-tight manner, one said cup-like element being an upstream element located adjacent the container, and the other being a downstream hollow cup-like element;

sanitary sealing means to protect and seal the interior of said upstream cup-like element from becoming contaminated while permitting successive passages of materials therethrough, said sanitary sealing means comprising a disk of a supple, fluid-tight, piercable material located between said hollow cup-like elements;



said upstream cup-like element having a hollow extension for connection to the container or to a tube coming out of the container; and

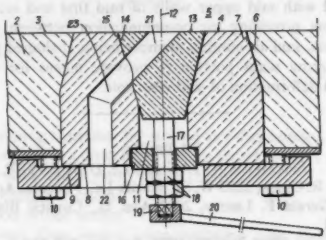
said downstream cup-like element having a closed extension with a weakened separation line between said extension and said downstream cup-like element whereby the extension may be broken under stress from said downstream cup-like element thereby providing access to said disk.

4,200,210

ROTARY SLIDE CLOSURE

Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 23, 1978, Ser. No. 936,118
Claims priority, application Austria, Sep. 16, 1977, 6659/77
Int. Cl.[2] B22D *41/10*
U.S. Cl. 222—598 **6 Claims**



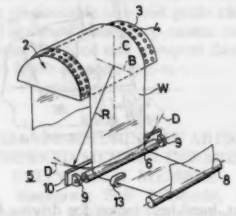
1. In a rotary slide closure for a vessel having an interior and provided with a fire-proof lining, in particular a casting ladle, of the type including a seat block having a surface forming a beveled seat, a closure block with a beveled surface contacting said seat block at said beveled seat and being rotatably mounted relative to said seat block, said closure block and said seat block each having at least one flow-through opening, said at least one flow-through opening of said closure block being capable of being brought into register with said at least one flow-through opening of said seat block, so as to form a pouring channel, by rotation of said closure block about a central axis, the improvement comprising said surface of said seat block that forms said beveled seat facing said interior of said vessel, said closure block contacting the surface of said seat block forming said beveled seat from the interior of the vessel, and said pouring channel extending from the interior of the vessel at the location of said central axis in said closure block to the exterior of the vessel at a point in said seat block laterally displaced from said central axis, said pouring channel running obliquely from the central axis towards said seat block and making a knee-shaped bend within said seat block to form a section, approximately parallel to and lateral of the central axis of the closure block, leading to the exterior of the vessel.

4,200,211

WEB GUIDE DEVICE

Kiichiro Yamagishi; Matutaro Hirose, and Sachio Muramatsu, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 3, 1978, Ser. No. 930,840
Claims priority, application Japan, Aug. 3, 1977, 52-93230
Int. Cl.[2] B65H *25/26, 17/32*
U.S. Cl. 226—21 **3 Claims**



1. In a web guide device for controlling the lateral position of a web in a web carrying line including a floating support means for floatingly supporting a web by a fluid cushion, and a solid support means downstream of said floating support means for supporting the web directly on a solid surface, such as that of a pass roller, the improvement comprising control roller means disposed between said floating and solid support means and downstream of said floating support means, said control roller means being brought substantially into contact with said web and being capable of swinging around a swing center line set substantially perpendicular to the surface of said web upstream of said control roller means, said swing center line located substantially directly above said control roller means and substantially coinciding with the center line of the web, said control roller means operating to laterally displace said web while simultaneously varying the feeding-in angle of said web with respect to said control roller means to thereby control the lateral position of said web.

4,200,212

PROCESS AND APPARATUS FOR CONVEYING INDIVIDUAL STRANDS INTO A COMPOSITE STRAND UNDER CONTROLLED SPEEDS AND TENSIONS

Wolfgang Hartig, and Erich Lenk, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Mar. 20, 1979, Ser. No. 22,181
Claims priority, application Fed. Rep. of Germany, Mar. 20, 1978, 2812100
Int. Cl.[2] B65H *25/24*
U.S. Cl. 226—24 **13 Claims**

7. An apparatus for conveying at least two individual strands into a composite strand under controlled speeds and tensional forces, said apparatus comprising:

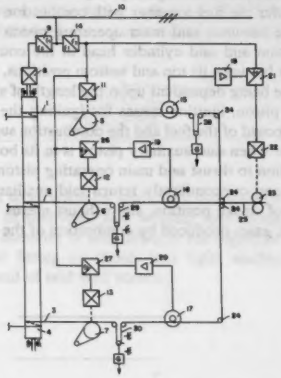
a plurality of conveying means comprising individual delivery means having a speed-controllable drive means for each of said individual strands and a common draw-off means having a speed-controllable drive means for said composite strand;

a reference input means for presetting the speed of the drive means of a first conveying means, said first conveying means being a predetermined first individual delivery means for a first strand of said individual strands;

means for storing and measuring the stored portion of the individual strand located between each of said individual delivery means and said common draw-off means;

a first control means responsive to the stored portion of said first strand delivered by said first predetermined individual delivery means to control the speed of the drive of said common draw-off means; and

additional control means allocated to each of the remaining individual delivery means of the other of said strands, said additional control means being responsive to the stored



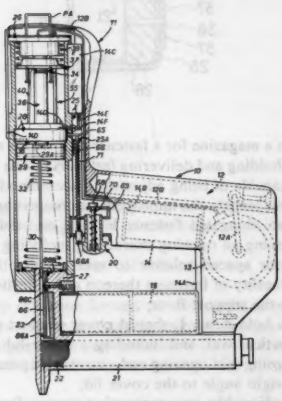
portion of its particular strand to control the speed of the drive means of its particular individual delivery means.

4,200,213

PERCUSSION APPARATUS

Maurice Liesse, Saint-Denis les Sens, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly, France

Continuation-in-part of Ser. No. 823,447, Aug. 10, 1977, abandoned. This application Nov. 2, 1978, Ser. No. 957,031
Int. Cl.[2] B25C *1/08*
U.S. Cl. 227—10 **15 Claims**



1. A percussion apparatus comprising a first housing, a main operating piston displaceable in said first housing from a rest position to a driven position and connected to a driver member; a second housing, an auxiliary piston displaceable in said second housing between a top and bottom end of stroke positions, retaining means for retaining said auxiliary piston in its top end of stroke position and actuating means for releasing said retaining means to initiate an operating cycle of said apparatus, means on said auxiliary piston for engaging said main operating piston to displace said main operating piston from its rest position to an intermediate position, a cylinder head disposed between said first and second housings and having an opening therethrough receiving said auxiliary piston and being

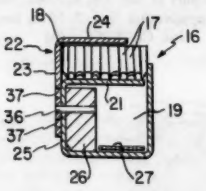
closed thereby, air inlet means into said first housing for admitting combustion supporting air, said auxiliary piston defining a predetermined storage capacity for fuel and having means to transfer the fuel together with combustion supporting air to a space between said main operating piston in its intermediate position and said cylinder head in the course of its displacement between its top and bottom positions, the volume of said space being dependent upon the length of stroke of said auxiliary piston, ignition means for igniting the explosive mixture composed of the fuel and the combustion supporting air in said space when said auxiliary piston is in its bottom end of stroke position to thrust said main operating piston to its driven position and concomitantly return said auxiliary piston to its top end of stroke position, and exhaust means for evacuating exhaust gases produced by combustion of the explosive mixture.

4,200,214

ADJUSTABLE MAGAZINE FOR FASTENER DRIVING TOOL

Allan J. Bobren, Des Plaines, Ill., assignor to Swingline, Inc., Long Island City, N.Y.

Filed May 10, 1978, Ser. No. 904,567
Int. Cl.[2] B25C *1/04*
U.S. Cl. 227—109 **2 Claims**



1. In a magazine for a fastener tool which magazine is capable of holding and delivering fasteners of one length and thereafter capable of being adjusted to accommodate fasteners of a different length, the improvement comprising

(a) an elongated fastener holding and delivering chamber having an opening therealong including fastener support floor spaced relative to said opening for supporting a plurality of fasteners thereon and a vertical wall attached to the support floor;

(b) a hold-down L-shaped cover element attachable to the vertical wall and including a cover lid at least partially closing said opening and a cover side piece substantially at a right angle to the cover lid;

(c) adjustable interconnecting means for connecting the cover element to the vertical magazine wall comprising bolt means on the magazine wall, a slot in the cover side piece to receive the bolt means and adjustable engaging means movable along the bolt means for engaging and disengaging the cover side piece to and from the magazine wall; and

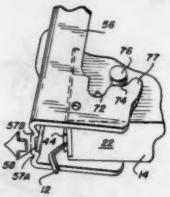
(d) alignment positioning means for selectively positioning in a plurality of positions the cover element with respect to and the magazine wall comprising projection pin means and plurality of complementary holes for receiving the projection pin means, the projection means positioned on one member and each complementary hole placed in the other member.

4,200,215

COMPRESSION TACKER

Raymond F. Novak, Itasca; Richard Doyle, Mt. Prospect, and Edmund Frank, Chicago, all of Ill., assignors to Duo-Fast Corporation, Franklin Pk., Ill.

Filed Jul. 5, 1978, Ser. No. 921,977
Int. Cl.[2] B25C *5/00*
U.S. Cl. 227—123 **33 Claims**



1. A compact, hand-held tacker for driving fasteners into a workpiece comprising

a body defining a handle portion and a nose portion,

a plunger mounted in said nose portion,

a driver blade coupled to said plunger,

means for driving said plunger and said blade through a fastener driving stroke,

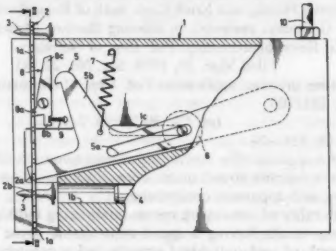
a jaw pivotally and removably secured to said nose portion, said driving means engaging said jaw to bias said jaw such that said jaw is locked in a first, tool operating position and upon release, is biased to a second, drive track clearing position.

4,200,216

DEVICE FOR TRANSPORTING FASTENING ELEMENTS THROUGH A SETTING DEVICE

Elmar Maier, Tisis, Austria, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 24, 1978, Ser. No. 936,594
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1977, 2738849
Int. Cl.[2] B25C *1/00*
U.S. Cl. 227—136 **7 Claims**



1. Setting device for driving fastening elements, comprising a housing, means in said housing for driving fastening elements in a first direction, a guide channel within said housing for guiding a belt-shaped magazine containing spaced fastening elements, said guide channel having an inlet end, an outlet end and extending transversely of the first direction, a transport device within said housing for moving the belt-like magazine in a step-wise manner through said guide channel for aligning fastening elements in the magazine in the path of said driving means, wherein the improvement comprises stop means movably displaceably mounted in said housing for displacement into said guide channel into a first position and a second posi-

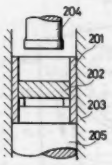
tion therein so that in the first position said transport device can be operated for moving the belt-like magazine and in the second position said stop means blocks the operation of said transport device for moving the belt-like magazine, said stop means comprises an elongated lever having a first end and a second end, said lever pivotally mounted in said housing with the point of pivotal attachment located intermediate the first and second ends of said lever and dividing said lever into a first lever arm extending from the point of pivotal attachment to the first end thereof and a second lever arm extending from the point of pivotal attachment to the second end thereof, said first lever arm being displaceable into said guide channel into the first and second positions of said stop means, and said second lever arm arranged to block said transport device when said first lever arm is in the second position.

4,200,217

METHOD OF MANUFACTURING AN ARTICLE HAVING A PRESS-WORKED MEMBER INWARDLY OF A CYLINDRICAL MEMBER

Kuninori Imai, Kanagawa; Soji Takahashi, Hachioji, and Masamoto Akeyama, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jul. 26, 1977, Ser. No. 819,056
Claims priority, application Japan, Aug. 6, 1976, 51-93186
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—161 **19 Claims**



1. A method of manufacturing an article having a press-worked member inwardly of a cylindrical member, said method comprising:

a first step for removing stain and oxidation film on the inner surface of a hollow member and on the peripheral side surface of a blank,

a second step for arranging said blank inwardly of said hollow member so that the purified surfaces of said blank and said hollow member may be faced toward each other,

a third step for subjecting said blank to a press-working in said hollow member to combine it with said hollow member and to form it into a desired shape, and

a fourth step for subjecting the combined members to an after-treatment to thereby provide said article of a desired shape in which said blank is tightly joined inwardly of said hollow member,

wherein said third step comprises a step for subjecting said blank to a cold press-working in said hollow member, and after that another step for subjecting said blank to a hot press-working in said hollow member to form said blank into a desired shape.

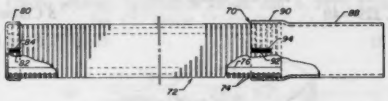
4,200,218

METHOD OF ATTACHING FITTINGS TO A CYLINDRICAL WELL SCREEN

Raymond A. Koehler, Oak Grove, Minn., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 18, 1978, Ser. No. 952,502
Int. Cl.[2] B23K *31/02*
U.S. Cl. 228—165 **3 Claims**

1. A method of attaching a cylindrical fitting to one end of a cylindrical, wire wrapped well screen which has a plurality of closely spaced wrap wires affixed to a plurality of longitudinal internal rods, comprising the steps of forming the fitting so its internal diameter is only slightly greater than the outer diameter of the wrap wires; forming a plurality of axially extending slots in one end of said fitting; telescopically placing the slotted end portion of the fitting over a plurality of wrap wires on one end of the well screen; and welding said fitting to



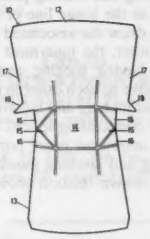
said last plurality of wrap wires by applying a weld bead along the length of each of said slots; said welding step serving to reduce the outside diameter of said fitting in the region of said slots to cause said fitting to shrink into tight mechanical contact with said end of said well screen.

4,200,219

CONTAINER FOR LIQUID PRODUCT

Gary A. Ramich, Neenah, Wis., assignor to American Can Company, Greenwich, Conn.

Filed Jun. 15, 1979, Ser. No. 48,881
Int. Cl.[2] B65D *5/24, 3/00*
U.S. Cl. 229—16 A **8 Claims**



1. A paperboard container for liquid product comprising:

(a) a front panel having a pair of side edges and a bottom edge;

(b) a rear panel having a pair of side edges and a bottom edge;

(c) a sealing flap extension formed on each of the side edges of the front panel, the sealing flap extensions being sealed to the side edges of the rear panel such that the front and rear panels are shaped to form a substantially cylindrical container;

(d) a bottom panel extending between the bottom edges of the front and rear panels to close the bottom of the container, the bottom panel having a pair of side edges;

(e) a triangular infolding bottom side flap attached to each of the side edges of the bottom panel and folded upward into the interior of the container;

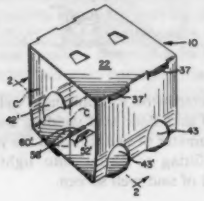
(f) a pair of gusset flaps connecting each of the bottom side flaps to each of the front and rear panels, the gusset flaps being folded against the adjacent bottom side flap; and

(g) an anti-leak tab extending outward from each of the sealing flap extensions on the front panel at the bottom portion thereof, the anti-leak tabs each being positioned between the adjacent gusset flaps and the inside of the rear panel to inhibit fluid flow therebetween.

4,200,220
WRAP-AROUND PAPERBOARD CARRIER WITH LATCHING AND LOCKING PANELS

Robert H. Ganz, Saddle River, N.J., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Oct. 27, 1978, Ser. No. 955,312
Int. Cl.[2] B65D *5/04*
U.S. Cl. 229—40 **5 Claims**

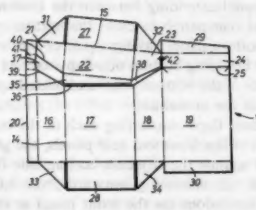


1. A package comprising an assembly of articles having the general form of beverage containers arranged in double row relation and enclosed in a tubular wrapper formed of a foldable sheet of paperboard or similar material of generally rectangular configuration which is divided into wall forming panels and wrapped about three sides of the article assembly and with end sections overlapped and secured in tight relation on the fourth side, said wrapper end sections including hinged terminal end portions forming latching and locking panels which are folded into interleaved relation and secured in the plane of the wall forming panels of said fourth side, each said locking and latching panel being sandwiched between the associated locking and latching panel and portions of the wall panel adjoining the hinged connection therewith, with terminal edge portions of at least one of said latching and locking panels being disposed in pressure engagement at the hinge line of the associated interleaved panel, so as to draw the associated fourth wall forming panels toward each other, the innermost one of said locking and latching panels having locking and latching elements which are spaced relative to each other in the direction normal to the hinge line of said locking and latching panels and which are interengaged with cooperating spaced locking and latching elements in adjacent innermost panel portions which overlie said innermost locking and latching panels, so as to hold said wall panels in tightly drawn relation about said article assembly.

4,200,221
BLANKS AND STRIPS THEREOF FOR THE FOLDING OF FLIP-TOP CIGARETTE BOXES

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 964,026
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1978, 2800393
Int. Cl.[2] B65D *5/54, 5/66*
U.S. Cl. 229—44 CB **12 Claims**

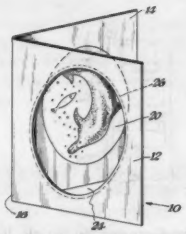


1. A blank of packaging material from which a flip-top box for cigarettes or the like may be folded, and including surface areas defining a front, back, side and floor walls of a main box portion, front, ceiling and side walls of a hinged lid portion, and a stiffening flap adapted to be folded against the inside of the lid front wall, characterized by: the surface areas defining a first lid side wall (**21**), the lid front and ceiling walls (**22, 27**) and a second lid side wall (**23**) being arranged in lateral succession opposite and forming an acute angle with, respectively, a first side wall (**16**), the front wall (**17**) and a second side wall (**18**) of the main box portion, a space within said acute angle being occupied by a stiffening flap (**35**) disposed between the front wall of the main box portion and the lid front wall, and the surface areas defining said first lid side wall, lid front and ceiling walls and second lid side wall being connected to the main box portion at one end by a fold strip (**41**) and at the other end by a hinge point (**42**), whereby during folding said lid surface areas and said main box portion surface areas are pivotally moved together about said hinge point to thereby close said acute angle.

4,200,222
GREETING CARD WITH REMOVABLE DECAL

Erwin P. Feuer, 1865 Brickell Ave., Miami, Fla. 33129

Filed Dec. 15, 1978, Ser. No. 969,816
Int. Cl.[2] B42D *15/00*
U.S. Cl. 229—92.8 **2 Claims**



1. A mailable greeting card, comprising:
a first section having a detachable decal assembly secured thereto by a first adhesive, said detachable decal assembly includes:
a decal including an indicia bearing face and a back,
a permanent adhesive connected to said back,
a removable backing sheet having one surface removably connected to and over said permanent adhesive, said removable backing sheet having a second surface connected to said first adhesive, and
a second section foldably connected to said first section, said second section having an opening therethrough in general alignment with said detachable decal assembly for exposing said indicia bearing face for viewing when said second section is folded upon said first section.

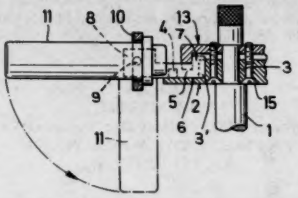
4,200,223
CENTRIFUGE ROTOR

Herbert Jaschkowitz, Ettlensegart 71, 7200 Tuttlingen, Fed. Rep. of Germany

Filed Oct. 30, 1978, Ser. No. 956,030
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2753265
Int. Cl.[2] B04B *5/02*
U.S. Cl. 233—26 **4 Claims**

1. A rotor for a swinging test tube centrifuge, the centrifuge comprising a disc-like base plate and an axially oriented collar on said base plate forming the hub of the centrifuge rotor, a plurality of pairs of U-shaped arms, the bases of said arms resting upon the base plate and one of each of said arms' upturned members bearing against said collar, a counter plate

concentric with said base plate engaging said upturned members of said arms that bear against said collar, and a protruding



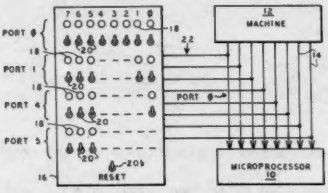
flange on said collar extending into the bight of each of said U-shaped arms in order to hold said upturned members of said arms against said collar.

4,200,224

METHOD AND SYSTEM FOR ISOLATING FAULTS IN A MICROPROCESSOR AND A MACHINE CONTROLLED BY THE MICROPROCESSOR

John R. Flint, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Aug. 21, 1978, Ser. No. 935,413
Int. Cl.[2] G06F *11/00*
U.S. Cl. 371—18 **12 Claims**



1. A method of independently testing both a microprocessor having a plurality of input/output ports, each port having a plurality of input/output leads, and a machine whose functions are controlled by the microprocessor, comprising:

(a) releasing each lead of the input/output ports from any logic level which is fixed by virtue of the status of the machine;

(b) writing, by means of a test program in the microprocessor, a test logic level to a first lead of a selected input/output port and propagating said test logic level from lead to lead of the selected input/output port such that only a properly functioning input/output lead assumes the test logic level and then reverts to an opposite logic level when the test logic level propagates to the next lead;

(c) sensing the logic level associated with each lead of the selected input/output port and generating a visual indication of which leads assume the test logic level;

(d) repeating steps (b) and (c) for the remaining input/output ports of the microprocessor;

(e) causing the microprocessor to assume a quiescent state in which it is electrically connected to the machine but in which state it exercises no control over the machine; and

(f) applying, by means external to the microprocessor, a machine-run logic level to at least one port normally coupling logic levels from the microprocessor to the machine, said machine-run logic level being selected to effect a known function of the machine,

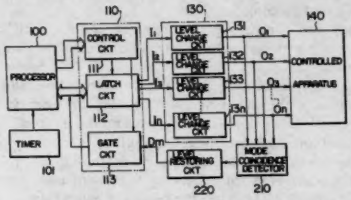
whereby, the operability of each input/output port of the microprocessor is determined by a visual indication of the test logic level propagating along each input/output port, and the functions of the machine are checked independently of the microprocessor to isolate fault conditions.

4,200,225

DIAGNOSTIC CHECK SYSTEM FOR DIGITAL SIGNAL CIRCUIT

Masahiro Ueno, and Ikuro Masuda, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 5, 1978, Ser. No. 912,316
Claims priority, application Japan, Jun. 6, 1977, 52/65796
Int. Cl.[2] G01R *31/28*; G06F *11/00*
U.S. Cl. 371—27 **18 Claims**



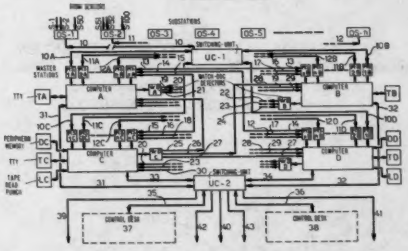
1. A diagnostic check method for a digital signal circuit comprising a processor for delivering a plurality of digital signals each representing binary information which takes a selected one of a first and a second mode, a controlled apparatus which is supplied with said plurality of digital signals, and an interface connected between said processor and said controlled apparatus for transferring said digital signals, said method comprising the steps of making the modes of said plurality of digital signals produced by said processor all coincident for a very short period that is too short for said controlled apparatus to be sensitive to the changes in said digital signals, and detecting the coincidence of mode of all the digital signals applied to said controlled apparatus from said interface during said short period.

4,200,226

PARALLEL MULTIPROCESSING SYSTEM FOR AN INDUSTRIAL PLANT

Giancarlo Piras, Milan, Italy, assignor to Euteco S.p.A., Milan, Italy

Filed Jul. 12, 1978, Ser. No. 923,864
Int. Cl.[2] G06F *11/00*
U.S. Cl. 371—9 **3 Claims**



1. A system for the automation of an industrial plant, such as a chemical plant the operating parameters of which are subject, at least partly, to monitoring and adjustment by digital electronic computers in dependence on signals representing the values of the aforesaid parameters, wherein said system comprises:

(a) a plurality of sensors for detecting the parameters of said plant to be monitored;

(b) four digital electronic computers each with a central memory, in which there are stored identical programs for processing the parameters of said plant which are to be monitored, said computers being laid out according to a matrix circuit;

(c) plant malfunction signaling means;

(d) connection means operatively and selectively interconnecting said computers to each other and to said sensors on the plant to be checked, one of said computers including;

means for reading in sequence all the incoming signals representing detected values of said parameters arriving from said sensors on said plant, based on said memorized program,

means for sending to the other computers signals identifying said readings,

means for comparing the detected values with corresponding stored values, based on said memorized program,

means for activating said plant malfunction signaling means in the event of a discrepancy between said detected values and said corresponding stored values, based on said memorized program; and each of the remaining three said computers including,

means connected for receiving from said one computer the signals identifying the readings being taken,

means connected for receiving from said sensors signals corresponding to the identification signals received from said one computer, and

means connected for comparing the signals received from the sensors with corresponding memorized values based on their memorized programs;

the system further comprising:

(e) four operational watch-dog detectors, each having one input and three outputs;

(f) means connecting the input of each watch-dog detector to a respective computer;

(g) means connecting the three outputs of each watch-dog detector to the three computers other than the one to which its input is connected;

(h) means in each computer for feeding its associated watch-dog detector with check signals at predetermined time intervals, the watch-dog detector associated with said one computer operating to generate a failure signal which is fed to the other three computers if said check signal fails to arrive at the predetermined time, and

(i) program-controlled means in said computers for selecting, from said remaining three computers, upon receipt of a failure signal from the watch-dog detector of said one computer, which of said computers is to take over from said one computer.

4,200,227

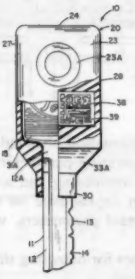
KEY ASSEMBLY FOR ELECTRONIC SYSTEM

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Filed Dec. 26, 1978, Ser. No. 973,527

Int. Cl.[2] **G06K** *5/00, 19/06;* **E05B** *35/00*

U.S. Cl. 235—382 **6 Claims**



1. A key assembly for use in an electrical system comprising in combination:

a manually operable key having a head portion and a shank portion shaped to permit the turning of said key in a lock receptacle,

a housing assembled to the head portion of said key, and

electrical coding means including a plurality of electrical circuit elements supported within said housing away from the surface of said key.

4,200,228

SNOW MAKING

Marvin D. Woerpel, 4833 Holiday Dr., Madison, Wis. 53711

Filed Sep. 18, 1978, Ser. No. 943,572

Int. Cl.[2] **F25C** *3/04*

U.S. Cl. 239—25 **7 Claims**

1. A method for snow making comprising incorporating ice nucleating microorganisms in water, introducing the water as fine droplets into the atmosphere at a temperature below freezing whereby the ice nucleating microorganisms initiate crystal formation to form snow.

4,200,229

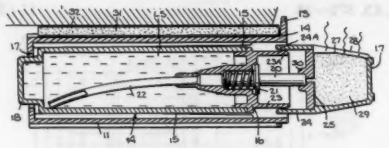
AROMA-DISPENSING CARTRIDGE AND HOLDER ASSEMBLY

Donald Spector, 380 Mountain Rd., Union City, N.J. 07087

Filed Dec. 20, 1978, Ser. No. 971,379

Int. Cl.[2] **A61L** *9/04*

U.S. Cl. 239—57 **10 Claims**



1. An aroma-dispensing cartridge and holder assembly comprising:

A a holder having an open mouth and a rear wall; and

B a replaceable cartridge insertable in said holder, said cartridge being constituted by a bottle which is received within the holder with its base adjacent said rear wall, said bottle being fillable with liquid scent, a stopper for the bottle, a suction pump mounted on the stopper and provided with a pipe extending into the bottle and a hollow plunger which is axially shiftable, the free end of the plunger being coupled to the base of an actuating head which projects outside of said holder and is provided with a vented internal chamber in communication with said plunger, said chamber having an absorptive pad therein, whereby when the head is pressed in to cause the plunger to make a forward stroke, liquid scent drawn from said bottle passes through said plunger and is injected into said pad which then exudes an aroma through the chamber vent.

4,200,230

SWIMMING POOL CLEANING HEAD

Henry D. Gould, 7734 N. 41st Ave., Phoenix, Ariz. 85021

Filed Mar. 16, 1979, Ser. No. 21,095

Int. Cl.[2] **A01G** *25/02*

U.S. Cl. 239—66 **9 Claims**

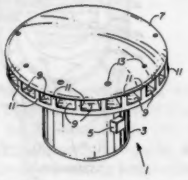
1. Apparatus for producing a high velocity fluid stream in a plurality of radial directions, said apparatus comprising in combination:

a. a support element, said support element having an opening for receiving pressurized fluid, said support element having disposed therein a first annular groove around said opening, said annular groove having a first inner edge and a first outer edge;

b. a top element having disposed therein a second annular groove, said second annular groove having a second inner

edge and a second outer edge, said top element being spaced from said support element;

c. an elastic strip loosely disposed between said first and second grooves, said elastic strip having a first end and a second end and having a relaxed configuration, said elastic strip being contoured so that in its relaxed configuration said first end presses against said inner edges and said second end presses against said outer edges, said elastic strip having a length such that pressurized fluid received through said opening presses both said first and second ends against said outer edges, thereby forming a nozzle opening between said first and second ends through which a high velocity fluid stream is ejected;



d. first means for engaging said first end along said inner edges when pressure of fluid in said opening is relieved, allowing said elastic strip to relax, said engaging of said first end and said relaxing in combination causing said second end to advance to a new position along said outer edges; and

e. second means for engaging said second end along said outer edges when fluid in said opening is repressurized, said engaging of said second end and said repressurizing in combination causing said first edge to advance to a new position along said outer edges,

whereby location of said nozzle opening is advanced to a new position.

4,200,231

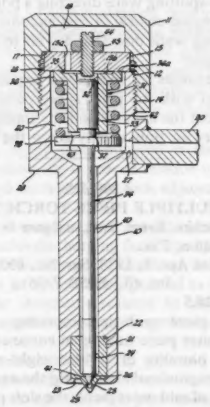
FUEL INJECTOR NOZZLE

Richard S. Knape, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 19, 1978, Ser. No. 916,963

Int. Cl.[2] F02M *45/10*

U.S. Cl. 239—94 **3 Claims**



1. A fuel injector nozzle assembly including an injector body providing a fuel chamber in communication with a recess having a spray outlet at one end of said injector body, a valve seat in said injector body defining the entrance to said recess, a cover member fixed to the opposite end of said injector body, a valve seat disc operatively fixed relative to said injector body for defining a control chamber with said cover member and for separating said control chamber from said fuel chamber, a fuel inlet in said injector body to said fuel chamber, a passage means through said valve seat disc providing for flow communication between said fuel chamber and said control chamber, a sleeve-like check valve movably positioned in said fuel chamber, said check valve having a central axial guide bore therethrough, an injection valve movably positioned in said fuel chamber of said injector body, said injection valve having a stem with a sealing portion, of a first predetermined diameter, at one end thereof engageable with said valve seat to block flow from said fuel chamber to said recess and a guide stem portion of a second predetermined diameter at its other end slidably received in said axial guide bore of said check valve, and a spring means operatively connected to said injection valve and to said check valve for normally biasing said injection valve in a direction whereby said sealing portion engages said valve seat and for normally biasing said check valve sleeve in a direction for sealing abutment against one side of said valve seat disc to block flow between said fuel chamber and said secondary chamber through said passage means, while accommodating opening movement of said injector valve relative to said valve seat when a predetermined fuel pressure exists in said fuel chamber and accommodating opening movement of said check valve relative to said valve seat disc when there is a predetermined pressure differential between said fuel chamber and said control chamber whereby to provide for a regulated pressure in said control chamber to act on the free end of said guide stem portion of said injection valve.

4,200,232

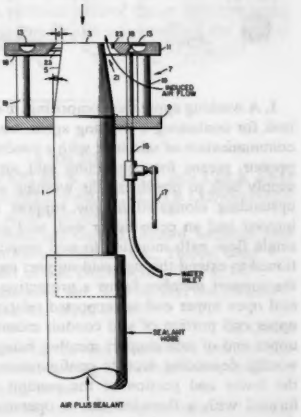
INDUCED AIR FLOW SELF-CLEANING SPRAY NOZZLE

Jack E. Fraley, Spokane, Wash.; Earl F. Sommers; Shorter Strang, both of Winter Haven, Fla., and W. C. McConnell, Whitmore Lake, Mich., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Oct. 23, 1978, Ser. No. 954,026

Int. Cl.[2] B05B *1/28, 7/00, 15/02*

U.S. Cl. 239—112 **5 Claims**



1. A spray nozzle adapted to spray a gas-material mixture and a fluid which externally mixes therewith comprising:

an elongated main conduit with a discharge end for transporting the gas-material mixture towards the discharge end, said conduit's outer surface being tapered in cross-sectional diameter near said discharge end;

a fluid spraying assembly mounted on said main conduit near

its discharge end, said assembly having a frontal housing with a ring having plurality of fluid discharge openings located in the ring around the main conduit's discharge end,

said housing being spaced from the tapered surface of said main conduit so as to form an opened space between the discharge openings and main conduit and around the main conduit's discharge end, said assembly also having a rear mounting housing for mounting the assembly to the main conduit and at least two support members spaced from each other so that air may freely pass therebetween, said support members rigidly holding the front ring to the rear mounting housing;

means for supplying a fluid under pressure to the fluid openings for discharging the fluid; and

means for supplying a material-gas mixture through said conduit to thereby induce an airflow through said opened space around the main conduit.

4,200,233

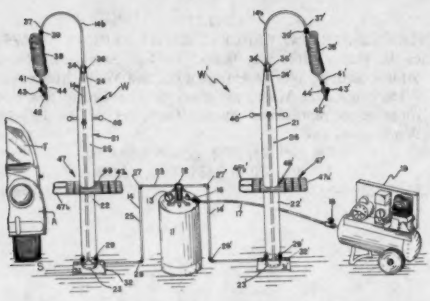
WINDSHIELD CLEANING SYSTEM

Ronald G. Mitchell, 1909 N. Juniper, Roswell, N. Mex. 88201

Filed May 4, 1978, Ser. No. 902,704

Int. Cl.[2] B05B *9/04, 15/06*

U.S. Cl. 239—280 **6 Claims**



1. A washing apparatus comprising, in combination, a supply tank for containing a washing agent, transfer means allowing communication of said tank with a conduit means, an air compressor, means for connecting said air compressor to said supply tank to pressurize the washing agent in said tank, an upstanding elongated hollow support member defining an interior and an open upper end, said conduit means with a single flow path mounted to said support member and positioned to extend through said support member interior so that the support member forms a protective barrier and through said open upper end in supported relationship therewith, the upper end portion of said conduit means extending from the upper end of said support member being formed in a downwardly depending arcuate configuration, spaced away from the lower end portion of the conduit means, a base plate formed with a threaded sleeve operatively connected to a threaded lower end of said support member for positioning said support member in a selected location allowing said support member to be removed for maintenance and part replacement, an extensible hose connected at one end to the upper end of said conduits means by a quick disconnect fitting and supported in an elevated position on said conduit, and a manually operated spray nozzle on the other end of said extensible hose for dispensing washing fluid onto a surface to the cleaned.

4,200,234

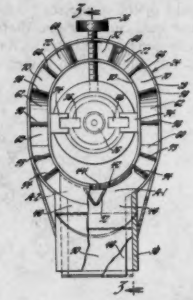
HOT AIR SHROUD FOR PAINT SPRAY GUN

Jack W. Baldwin, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1978, Ser. No. 953,195

Int. Cl.[2] B05B *1/28*

U.S. Cl. 239—296 **2 Claims**



1. An improved air shroud assembly adapted to be attached to paint spray apparatus during application of humidity-sensitive, aqueous-based paint for producing a continuous and evenly distributed flow of dry air about the paint spray pattern, the improved shroud assembly comprising:

a thin-walled housing with a tubular portion forming a passage for dry air and an integral mounting portion forming a passage for the paint spray pattern, the portions being oriented one to another so that the direction of dry air flow entering the housing is non-parallel to the direction of the paint spray pattern, the mounting portion having an apertured rear wall for attachment to the spray apparatus about the paint outlet thereof and further having walls defining an annulus framing the spray pattern and through which the flow of dry air passes;

baffle means in the housing for distributing the flow of dry air evenly about the spray pattern and changing the dry air flow direction parallel therewith, said baffle means including a flow-splitting portion formed by walls extending into the dry air flow through the tubular portion, one of the flow-splitting walls directing a portion of the dry air flow to a region central of said annulus, the other of said flow-splitting walls directing dry air to either side of said central region;

vanes in the annulus for redirecting dry air flow to a direction parallel with the paint spray pattern as the dry air emerges from the annulus and for simultaneously distributing the dry air flow evenly about the spray pattern.

4,200,235

MULTIPLE PIECE TORCH TIP

Charles P. Monschke, Krum, Tex., assignor to Victor Equipment Company, Denton, Tex.

Filed Apr. 3, 1978, Ser. No. 892,971

Int. Cl.[2] B05B *7/06*

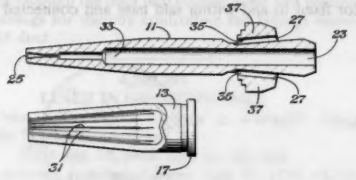
U.S. Cl. 239—424.5 **3 Claims**

1. A multiple piece torch tip comprising:

a. a tubular outer piece having an entrance end and an exit end and a plurality of at least eight regularly spaced, generally longitudinal slots along the exit end of the interior surface of said outer piece; the slots of said outer piece decreasing in size radially outwardly and monotonically decreasing in cross sectional area toward said exit end such that said slots of said outer piece define a generally frusto-conical shape converging in the direction of the exit end of said outer piece; and

b. an inner piece interchangeably disposed within said outer

piece; said inner piece having an interior passageway penetrating longitudinally therethrough for cutting oxygen passage and having an exterior of a frusto-conical shape conformingly fitting at least a portion of said interior surface of said outer piece and of a size such that the exterior of the inner piece combines with the peripheral



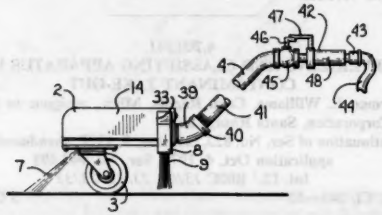
walls of the slots on the interior of the outer piece to form preheat orifice configurations of said frusto-conical shape converging in the direction of the exit end of said outer piece and spaced substantially equally about said cutting oxygen passageway traversing longitudinally of the center of said inner piece.

4,200,236

MOBILE WATER JET SWEEP CLEANER

Jack E. Briar, Gardner, Kans., assignor to Briar Industries, Inc., Gardner, Kans.

Filed Sep. 15, 1978, Ser. No. 942,786
Int. Cl.[2] B05B *15/06*
U.S. Cl. 239—532 **4 Claims**



1. A mobile water jet sweep cleaning device comprising:

(a) an open bottom housing having an integral top wall and depending front and end walls; and pairs of depending laterally spaced walls extending rearwardly from the front wall with said pairs spaced inwardly from each of the end walls and having notches extending upwardly from lower edges thereof;

(b) an elongate spray pipe mounted in said notches and extending horizontally in spaced relation to the front wall, said spray pipe having closed ends adjacent the end walls of the housing;

(c) a plurality of spray nozzles spaced apart on said spray pipe, said nozzles discharging fan shaped jet sprays downwardly and forwardly under the front wall with the long widths of the jet sprays being parallel to the spray pipe;

(d) caster roller structures secured to the pairs of walls closing the notches and retaining the spray pipe in the housing;

(e) a pipe connected to the spray pipe and extending rearwardly and upwardly therefrom and serving as a handle to be grapsed by an operator, said pipe having a cut off valve therein and a fitting for connection to a conduit for supplying water under pressure;

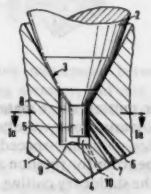
(f) a brush secured to the housing at the rear thereof and having ends extending outwardly relative to end walls of the housing, said brush having downwardly extending bristles terminating in lower ends normally spaced above a surface to be cleaned and engagable with said surface by lowering of the handle pipe for scrubbing the surface.

4,200,237

FUEL INJECTOR

Alfred Urlaub, Nuremberg, and Eckart Muller, Schwabach, both of Fed. Rep. of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed May 30, 1978, Ser. No. 910,740
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1977, 2726074
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—533.12 **6 Claims**



1. A fuel injector for internal combustion engines in which an axially slidable nozzle needle is provided which is capable of being lifted off its sealing seat to expose a gap therein by the pressure of the fuel against the force of at least one spring, said nozzle needle being formed with a control pintle below its sealing seat which slides in a blind-hole type recess in the nozzle body and at least substantially covers at least one spray hole when the nozzle needle is closed, the improvement comprising a cavity starting immediately below the sealing seat and formed as an eccentric widening extending parallel to the blind-hole type recess, said spray holes opening into said blind-hole type recess and the cross sectional areas of the nozzle seat gap and the cavity at each position of the needle nozzle are greater than the cross sectional area of the at least one spray hole uncovered at any time by the movement of the control pintle.

4,200,238

METHOD OF PREPARING A RAPIDLY SOLUBLE AND MACHINE HANDLEABLE PARTICULATE COMPOSITE AND PRODUCT

Melvin H. Keyes, Sylvania, and Garry L. Moore, Swanton, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 839,160, Oct. 3, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,300
Int. Cl.[2] B02C *17/00*
U.S. Cl. 241—21 **22 Claims**

1. A method of increasing the rate of solubility and machine handleability of a material having a relatively low solubility comprising the following steps:

a. pulverizing a relatively low solubility material and obtaining a selected first size fraction from said pulverized material,

b. mixing said first size fraction with a predetermined proportion of water to form a composite,

c. drying and pulverizing said composite,

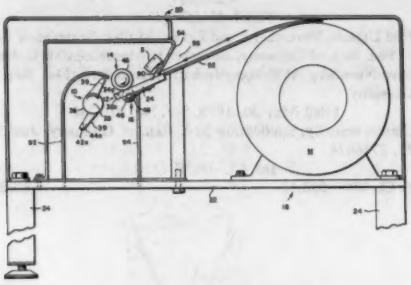
d. obtaining from said pulverized composite a second selected size fraction having an increased rate of solubility and machine handleability.

4,200,239

MACHINE THAT QUADRATES DOCUMENTS

James V. Simone, and Kalin I. Sheppard, both of High Point, N.C., assignors to Wright Line Inc., Worcester, Mass.

Filed Jul. 14, 1978, Ser. No. 924,510
Int. Cl.[2] B02C *18/16, 25/00*
U.S. Cl. 241—36 4 Claims



1. Apparatus for cutting sheet material into discrete chips comprising a stationary, downwardly-inclined plate having along its lower edge uniformly-spaced cutting teeth, a rotor, means mounting the rotor for rotation about an axis parallel to the lower edge of the stationary cutting plate, said rotor having axially thereof uniformly-spaced cutting teeth arranged to mesh with the cutting teeth at the lower edge of the stationary cutting plate, means for moving sheet material downwardly on the surface of the stationary plate comprising a driven rubber-covered feed roll positioned above and transversely of the plate for rotation about an axis parallel to the plate such that its surface has tangential engagement with the upper surface of the plate upstream of the lower edge and a plurality of spaced idler feed rolls positioned below the plate for rotation about axes parallel to the plate, said plate having openings through which the idler feed rolls project to substantially the level of the upper surface of the stationary plate so as to have tangential engagement with the driven feed roll, means yieldably biasing the idler feed rolls toward the driven feed roll, motor means for effecting rotation of the driven feed roll and for effecting rotation of the rotor for advancing the sheet material to the cutting edge of the stationary plate, means dynamically balancing the rotor and a fly wheel fixed to the shaft of the rotor.

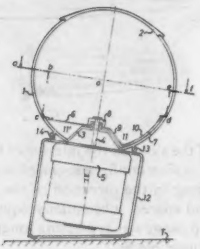
4,200,240

APPARATUS FOR MINCING AND/OR BEATING AND/OR MIXING EDIBLE MATERIALS SUCH AS MEAT, FRUIT AND VEGETABLES

Robert M. Machuron, 37 rue Louis Desautels, Saint Vallier, France (71230)

Continuation-in-part of Ser. No. 786,594, Apr. 11, 1977, abandoned. This application Jun. 12, 1978, Ser. No. 914,861
Claims priority, application France, Sep. 16, 1976, 76 2771
Int. Cl.[2] B02C *18/18, 18/24*
U.S. Cl. 241—37.5 4 Claims

1. In a power-driven mixing, comminuting and blending apparatus, a hollow base, an essentially spherical container supported on and surmounting said base to have an upright diametral axis of symmetry, said container at its base being formed as a re-entrant frusto-conical protuberance symmetrical about said axis at the lower end thereof, a shaft journaled in said base for rotation coaxially with said axis and extending upwardly through said protuberance and terminating below a first plane lying intermediate the top and bottom of the container and disposed normal to said axis, a knife fixed to the upper end of said shaft contiguous with and above said protuberance, said knife including a first portion passing radially outwardly and downwardly from said axis, closely adjacent to the surface of said protuberance, and a second portion integral with said first portion and arcuately shaped to extend upwardly from the radially-outward terminus of said first portion and closely adjacent to the surface of said container, said second portion terminating in a second plane normal to said axis and intersecting the same at a point substantially below the point of intersection of said first plane with said axis, means for securing the container to the base against rotation relative to the base and means for locking the container to the base, and a motor fixed to and within said base and connected with said



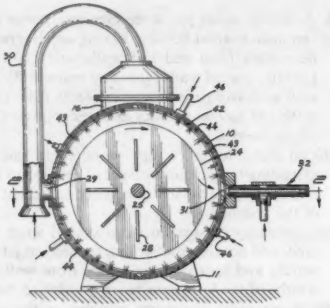
shaft to rotate the same, said knife also including a third portion diametrically opposite from said first and second portions and lying in and rotating in a third plane normal to said axis and substantially below said second plane, said container having an access opening in its top, symmetrical with respect to said axis, and a cover to fit the rim of said opening to close the opening, said base being constructed and arranged, when supported on a horizontal surface, to mount said axis at an angle of 5° to 20° to the vertical.

4,200,241

PULVERIZING AND CLASSIFYING APPARATUS WITH CONTAMINANT TAKE-OUT

Norman E. Williams, Coon Rapids, Minn., assignor to Bepex Corporation, Santa Rosa, Calif.

Continuation of Ser. No. 822,721, Aug. 8, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 948,491
Int. Cl.[2] B02C *13/08, 23/12, 23/32*
U.S. Cl. 241—52 5 Claims



1. In a pulverizing and classifying apparatus comprising a cylindrical housing having inlet and discharge means adjacent opposite ends, rotary horizontal axis pulverizing means within the housing adjacent the inlet end and coaxial rotary classifying means within the housing adjacent the discharge end, and port means adjacent said classifying means for withdrawing tailings for recycling, the improvement comprising an aperture in said housing wall independent of said port means, said aperture being located adjacent said classifying means and spaced-apart from said port means, and a contaminant take-out device

mounted on said housing and communicating with said aperture, said device comprising:

(1) a gas-transmitting tubular duct, one end of which communicates with said aperture in the housing wall, said duct receiving a portion of said tailings,

(2) a housing surrounding said duct, and

(3) a gas inlet for said housing, said gas inlet providing gas under pressure around said duct whereby the gas is transmitting through the duct into contact with said portion of said tailings for thereby controlling the tailings received by said duct.

4,200,242

LINER IN GRINDING MILL

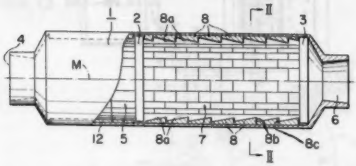
Hiroshi Ueda, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

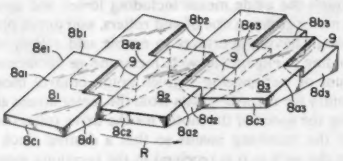
Filed Sep. 18, 1978, Ser. No. 943,218

Claims priority, application Japan, May 29, 1978, 55-73228

Int. Cl.² B02C *17/22*

U.S. Cl. 241—183 **6 Claims**





1. In a grinding mill of the class comprising a mill drum having a material feed inlet and discharge outlet and driven in rotation about the axial centerline thereof and grinding media of various sizes accommodated within the drum, the combination therewith of a liner covering the inner wall surface of the drum and comprising a plurality of lining units, each of which has upstream and downstream ends respectively nearest said inlet and outlet and has an inner working surface inclined to progressively approach said centerline from the upstream end to the downstream end, the lining units being secured to the drum with mutual dispositions such that lining units which are mutually adjacent in the drum rotational direction are mutually staggered in the drum longitudinal direction, each lining unit being provided at its leading side part in the drum rotational direction and toward its downstream end part with a guide surface joining in a continuously flush manner the inclined working surface of the adjacent lining unit in the rotational direction.

4,200,243

COMMINUTION DEVICE

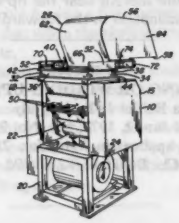
Russell I. Peterson, Jr., Oil City, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed Nov. 23, 1977, Ser. No. 854,129

Int. Cl.² B02C *18/16*

U.S. Cl. 241—224 **4 Claims**

1. A comminution device comprising: a generally vertically extending housing member having an upwardly open material receiving opening formed therewithin; comminution means supported within said housing member below said opening and operable to effect size reduction of material fed thereto through said opening; a loading hopper member having a vertically extending throat portion with a lower end, cooperable slide means having relatively movable portions carried by said lower end and a portion of said housing member adjacent said opening, respectively, to continuously captively support said hopper member with respect to said housing member



while permitting relative movement between said hopper member and said housing member, and said movable portions of said cooperable means being movable through an extent to selectively locate said throat portion in a closed position in vertical alignment with said opening and an open position offset from said housing member to provide access to said comminution means through said opening.

4,200,244

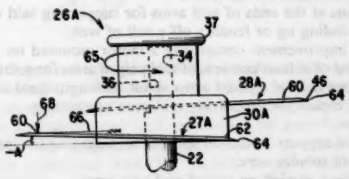
READILY INSTALLED FOOD PROCESSOR CUTTER TOOL WITH NEGATIVE BLADE LIFT

Carl G. Sontheimer, 14 Gray Oaks La., Greenwich, Conn. 06830

Continuation of Ser. No. 747,412, Dec. 6, 1976, abandoned. This application May 3, 1978, Ser. No. 902,741

Int. Cl.² B02C *18/12*

U.S. Cl. 241—282.1 **9 Claims**



1. In rotary food processing apparatus having an upright working bowl with a vertical motor-driven shaft extending up into the bowl with its axis of rotation extending along the central axis of the bowl and in which a rotatable tool has a hub removably engaging down upon said drive shaft by a straight-line manual manipulation in driving relationship with the shaft provided with axially extending driving coupling means and such tool has a plurality of thin rigid cutter blades secured to said hub and extending outwardly therefrom, a lower one of said blades normally being positioned near the bottom of said vessel along the length of said blade with a small spacing between the bottom of said vessel and said lower blade, and said lower blade extending out to a diameter close to the full diameter of said bottom for permitting the operation of the apparatus with very small amounts of food, and a second one of said blades being positioned at a higher elevation on said hub, said lower blade having a swept back shape with its outer end trailing behind its inner portion, the improvement comprising:

means for preventing said lower blade from dynamically climbing upwardly through pulverulent food material being processed for preventing said hub from being lifted upwardly relative to said drive shaft,

said preventing means including a downward inclination in the forward direction of rotation of the outer portion of said lower blade for developing a downward thrust on said lower blade as the outer portion of said lower blade revolves and moves at relatively high velocity through the food material in said working bowl,

a major inner portion of the radial extent of the lower blade being substantially parallel with the bottom of said vessel, and

said outer portion thereof near the tip being bent into said downward inclination in the forward direction.

4,200,245

WEB FEEDING OR WINDING-UP APPARATUS

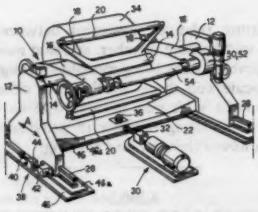
Aldo Bugnone, Via Bellini 2, Turin, Italy

Filed Jun. 2, 1978, Ser. No. 912,149

Claims priority, application Italy, Jun. 2, 1977, 68265 A/77

Int. Cl.[2] B65H *17/02, 19/06, 25/26*

U.S. Cl. 242—64 **4 Claims**



1. In a web feeding or winding up device for use in connection with machines operating on a web, and comprising:

base means,

two lateral uprights,

at least one pair of arms carried rotatably about a substantially horizontal axis between said two lateral uprights,

a hollow tubular core, and

means at the ends of said arms for supporting said core for winding up or feeding off a roll of web,

the improvement comprising a motor mounted on the free end of at least one arm of said pair of arms for rotating said core carried by said arms about its longitudinal axis,

said means for supporting said core comprising:

a bar,

radial support blocks on said bar for engaging the interior of said tubular core,

a sleeve carried on one of said two arms,

means defining internal axial splines on said sleeve,

a plurality of radial teeth on one end of said bar engageable in said splines in said sleeve,

a bearing housing carried by the other of said two arms,

the other end of said bar carrying a bearing supported in said housing, and

means for displacing said housing in the axial direction of said bar.

4,200,246

CONVEYOR DEVICE FOR A THIN WEB AND A METHOD OF CONVEYING

Bruno Schneider, Renens; Fritz Nigg, Bissigny, and Jean-Claude Risse, Prangins, all of Switzerland, assignors to J. Bobst & Fils, S.A., Lausanne, Switzerland

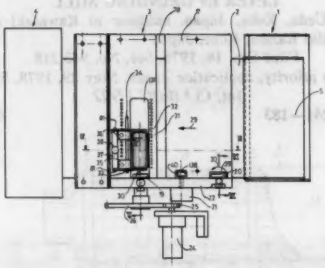
Filed Apr. 10, 1978, Ser. No. 895,113

Claims priority, application Switzerland, Apr. 14, 1977, 4617/77

Int. Cl.[2] B65H *17/02*

U.S. Cl. 242—67.4 **10 Claims**

1. In a conveyor device for conveying a thin web through a station in both directions with a desired registry, said device including a supply means for storing a thin web, guide means for guiding the thin web after it is removed from the supply means and transporting it through the station, and receiving means for taking up the thin web after it has passed through the guide means, the improvements comprising the supply means including a cassette with a free rotating reel upon which the web can be wound, means for supporting said cassette on the frame of the device for movement in a direction transverse to the direction of movement of the web; said receiving means including a take up reel for winding up the web discharged from the guide means and including drive means for rotating the take up reel, and said guide means including an upper plate and lower platen for receiving the web with a side guide member, means for continuously holding an edge of the web in contact with the side guide member, drive means for moving the web through the guide means including lower and upper rollers and a motor rotating one of said rollers, said upper plate and lower platen having apertures to enable said rollers and means for holding to engage the web, meter means for measuring the amount of web passing a given point, control means having a memory for recording data from the meter means and for controlling the speed of the motor for the drive rollers and the motor of the receiving means so that a desired slack is maintained in the web as it is received in the receiving means to prevent tensoning the portion of the web in the guide means.



4,200,247

CASSETTE FOR ROLL FILMS, WITH A CATCH FOR PREVENTING DRAWING IN OF THE END OF THE FILM

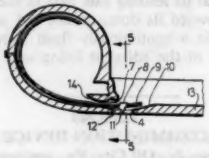
Achim Kluczynski, Overath, and Erik Altmann, Muehlheim, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jan. 23, 1979, Ser. No. 5,982

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1978, 2803758

Int. Cl.[2] G03B *1/04*

U.S. Cl. 242—71.2 **3 Claims**



1. A film cassette for a film camera having a film passage comprising a spool-less supply chamber for containing a roll of film and protective paper strip, a take up chamber with a spool for taking up the film and the protective paper strip, a bridge arranged between the chambers to form a rear contact surface and guide for the film, a depression formed in the web at the

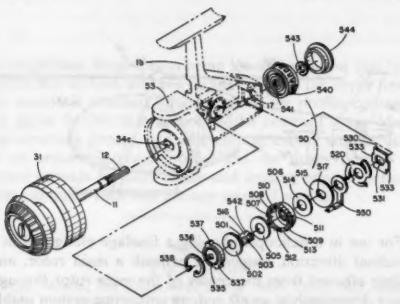
take-up end thereof before the take-up chamber, a limiting wall and first and second recesses in the film passage, and a resilient catch element formed from the cassette wall and located in the depression, which catch element has a taper and a slope and is adapted to engage in a perforation at the end of the film whereby it is drawn by the film during transportation of the film through the film camera, a knob on the catch element which is urged against the limiting wall of the film passage and is received in the first recess provided therein and simultaneously the slope on the catch element is received in the second recess, whereby the take-up chamber is sealed and the film retained in the desired position.

4,200,248

INTERNAL DISC DRAG FOR SPINNING REEL

John W. Puryear, Tulsa, Okla., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 11, 1978, Ser. No. 932,843
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—84.51 A **15 Claims**



1. In an open face spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting, the reel having a housing, a center shaft mounted in the housing, with a major portion of the shaft in the housing, a spool securely mounted on the shaft for holding the fishing line, a handle and gear train assembly mounted in the housing, a rotor coaxially mounted on the shaft and rotatable by cooperative movement of the handle and assembly, and a movable bail mounted on the rotor having an open casting position and a closed retrieving position, limited rotation of the spool being desirable when retrieving the bait with a fish caught thereon, the improvement comprising a free-floating drag assembly that permits such limited spool rotation;

(a) the center shaft having a forward end supporting the spool and a rearward end with a modified keyable shaft portion,

(b) a drag adjustment screw mounted on the shaft and having a washer portion and an elongated shank, the shank having a longitudinal keyable portion and a threaded end, the shank having a concentric longitudinal hole, the rearward end of the shaft mounted in the shank hole and partially supported thereby,

(c) first friction means mounted on the shank adjacent the washer portion,

(d) a housing cup having a back closure with a center hole therein and having an intersurface and an exterior surface and a circular side wall secured at a first end of the interior surface of the closure and a second end being open, the wall having an exterior surface and at least one open notch extending through the wall at the second end, the center hole sufficiently large for slip-fit mounting the cup on the shank adjacent the first means,

(e) second friction means mounted on the shank adjacent the exterior surface of the back closure,

(f) a washer keyable mounted on the shank and adjacent the second means,

(g) a spring mounted on the shank adjacent the flat washer,

(h) an alignment plate keyable mounted on the shank being adjacent the spring, means on the exterior of the plate for preventing rotation of the screw when mounted in the housing, the spring having radially projecting arms in contact with the washer,

(i) a drive mounted in the cup having a central hole keyed to the shaft, the drive having a lug mating with the notch in the cup wall so that when the shaft rotates the drive causes the cup to rotate,

(j) means for securing the drive, the washer portion of the shank and the first friction means in the cup,

(k) a hole in the housing coaxial with the shaft, the threaded end of the shank mounted in the housing hole with a portion thereof extending outside the housing, and

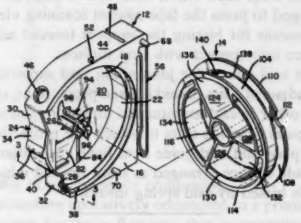
(l) means mounted on the threaded shank for tightening or loosening the drag assembly.

4,200,249

STORAGE DEVICE

Floyd L. Synstelien, 323 S. Second St.East, Aurora, Minn. 55705, and Howard T. Ysteboe, 80 Pleasant View Ter., New Cumberland, Pa. 17070

Filed Jan. 8, 1979, Ser. No. 1,488
Int. Cl.[2] B65H *49/00, 75/30*
U.S. Cl. 242—96 **13 Claims**



1. An improved storage device for strand material including a case having a bobbin recess and a bobbin in the recess; the bobbin recess being defined by a rear wall, a generally cylindrical wall joining the rear wall and extending partially around the recess and a friction member between the ends of the generally cylindrical wall, the friction member including a brake located radially inwardly of the generally cylindrical wall and a spring connecting the brake to the case; the bobbin including a generally cylindrical winding surface spaced radially inwardly from the generally cylindrical wall; the bobbin and case including connection means securing the two together while permitting the rotation of the bobbin in the recess; a strand material loading opening extending through the generally cylindrical wall; said spring biasing said brake against the winding surface to limit rotation of the bobbin within the case and to hold wound lengths of strand material in place on the winding surface.

4,200,250

PRESSURE PAD SUPPORT FOR A CASSETTE

Karl Fischer, and Josef Stebegg, both of Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1978, Ser. No. 969,648
Claims priority, application Austria, Jan. 13, 1978, 243/78
Int. Cl.[2] G03B *1/04*
U.S. Cl. 242—199 **4 Claims**

1. A cassette for a record carrier formed as a tape extending between two winding hubs, comprising

two cover surfaces,

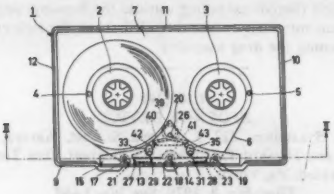
two winding hubs arranged between said cover surfaces,

a tape extending between said hubs,

side surfaces interconnecting said cover surfaces, one of said side surfaces having at least two openings arranged to permit scanning elements to cooperate with the tape,

a support arranged with a longitudinal direction substantially parallel to said one side surface between said cover surfaces,

means for movably and pivotably journalling said support with respect to said cover surfaces, said means comprising a pair of coaxial projections extending perpendicular to one of said cover surfaces, and corresponding guide slots extending parallel to the cover surfaces and substantially perpendicular to said one side surface, each coaxial projection engaging a respective slot,



two elastic pressure members supported on said support spaced from each other, each near a respective opening, arranged to press the tape against scanning elements, and

spring means for biasing the support toward said one side surface into contact with stop surfaces,

wherein said means for journalling said support comprises two adjacent pairs of said coaxial projections, spaced from each other in said longitudinal direction; and two respective pairs of guide slots in which the projections engage with play; and said guide slots have ends adjacent to said one side surface arranged as stops toward which the support is biased by said spring means.

4,200,251

DEVICE FOR A SIGHT

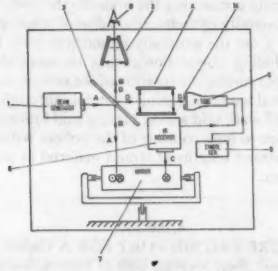
Jan Börjesson, and Bertil Eriksson, both of Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Oct. 31, 1977, Ser. No. 847,385

Claims priority, application Sweden, Nov. 5, 1976, 7612354

Int. Cl.[2] F41G *7/12*

U.S. Cl. 244—3.13 **16 Claims**



1. Improved missile guiding apparatus of a type wherein a guide beam of radiation is directed at a target and a missile is guided to the target by sensing the guide beam and following the beam to the target, the improvement comprising:

movable scanning means for viewing a visible light image of said target within a particular visible light field of view and directing said guide beam of radiation to a location indicated within said particular visible light field of view by a first alignment mark; and

auxiliary viewing means for receiving infrared radiation from said target within a particular infrared radiation field of view and imaging said infrared radiation, including means for adjusting the position of a second alignment mark relative to the portion of said movable scanning means and the axis of said guide beam to allow said guide beam to be directed to a position defined by said second alignment mark within said infrared radiation field of view.

4,200,252

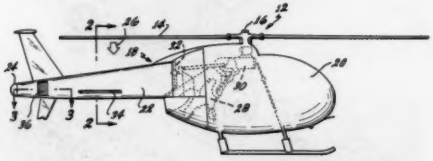
HELICOPTER ANTITORQUE SYSTEM USING CIRCULATION CONTROL

Andrew H. Logan, Rancho Palos Verdes, and Richard E. Moore, Los Angeles, both of Calif., assignors to Summa Corporation, Las Vegas, Nev.

Filed Dec. 21, 1977, Ser. No. 862,814

Int. Cl.[2] B64C *27/82*

U.S. Cl. 244—17.19 **10 Claims**



1. For use in a helicopter having a fuselage elongated in a longitudinal direction, suspended beneath a main rotor, and extending aftward from the center of the main rotor through the rotor downwash to an aft end, an antitorque system usable at high flight speeds, comprising:

a linear nozzle extending generally in the longitudinal direction along the fuselage on one side of it and oriented to discharge a sheet of fluid substantially tangentially to the fuselage and downwardly around it;

a source of fluid communicating with said linear nozzle to supply fluid to it under sufficient pressure to produce a flow of fluid through said linear nozzle characterized by a momentum coefficient between 0.2 and 0.8, a flow velocity between 2.5 and 4.5 times the velocity of the rotor downwash, and wherein the thickness of the sheet of fluid as it is discharged from said linear nozzle is between 4.0 and 20.0 millimeters; and,

a jet thruster located near the aft end of the fuselage, communicating with said source of fluid to receive fluid from it, and oriented to discharge the fluid laterally from the side of the fuselage opposite the side on which said linear nozzle is located so as to produce an antitorque reaction force when flight conditions render said linear nozzle ineffective for that purpose.

4,200,253

AIRCRAFT WING DROOPING LEADING EDGE DEVICE

Ralph Rowarth, South Cave, England, assignor to British Aerospace, Weybridge, England

Filed Apr. 3, 1978, Ser. No. 892,908

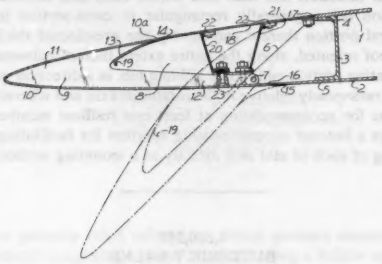
Claims priority, application United Kingdom, Apr. 6, 1977, 14619/77

Int. Cl.[2] B64C *3/48*

U.S. Cl. 244—219 **7 Claims**

1. An aircraft wing with a high lift leading edge device, comprising a wing main body having upper and lower skins, a leading edge structure with a skin having upper and lower skin portions said leading edge structure being substantially rigid thereby preserving a substantially constant skin shape, single-

axis hinge means whereby said leading edge structure is hingedly mounted on said wing main body to droop downward into a low speed configuration, an upper flexible skin section extending between the constant shape upper skin portion of the leading edge structure and the upper skin of the main body of the wing, a lower flexible skin section extending between the constant shape lower skin portion of the leading edge structure and the lower skin of the main body of the wing,



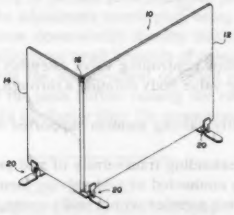
said single-axis hinge means being located adjacent said lower flexible skin section, and link means to which the upper flexible skin section is attached for controlling the profile contour of said upper flexible skin section as the constant shape leading edge structure droops, and wherein the leading edge structure has an arcuate internal profile, and the upper flexible skin section extends forward inside said leading edge structure in sliding contact with said arcuate internal profile.

4,200,254

PANEL BASE

George Nelson, 251 Park Ave. South, New York, N.Y. 10010

Filed Jun. 1, 1978, Ser. No. 911,547
Int. Cl.[2] E04H *1/00*
U.S. Cl. 248—188.8 9 Claims



1. An apparatus for supporting a wall panel or the like, said apparatus comprising:

(a) first member means operable for engaging and releasably connecting to a wall panel;

(b) second member means connected to said first member means and including

(i) foot means for engaging a ground surface and

(ii) first means interconnecting said first member means and said second member means for permitting relative vertical and pivotal adjustment between said first and second member means and thus vertical and pivotal adjustment of a wall panel supported thereby with respect to a ground surface, said first means comprising:

(A) a first generally flat member fashioned upon said first member means;

(B) a second generally flat member fashioned upon said second member means; and

(C) second means for adjustably interconnecting said first generally flat member and said second generally flat member at any one of a plurality of relative vertical and pivotal adjustment positions, said second means comprising:

(I) vertical slot means fashioned through one of said first and second generally flat members;

(II) first aperture means extending through the other of said first and second generally flat members and having an axis intersecting the centerline of said vertical slot means; and

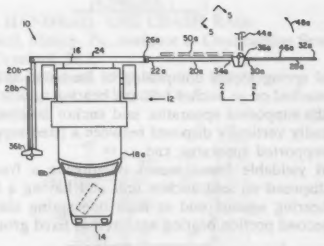
(III) first fastener means extending through said first aperture means and said vertical slot means for selectively interconnecting said first and second generally flat members in any one of a plurality of relative vertical adjustment positions.

4,200,255

FOLDABLE BOOM ASSEMBLY

Donald K. Schmidt, and Patrick Kuhn, both of Bismarck, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 17, 1978, Ser. No. 934,295
Int. Cl.[2] A01C *25/62*
U.S. Cl. 248—289 A 16 Claims



1. A foldable boom assembly comprising:

a support structure operatively connected to a prime mover;

an inner boom having a first end that is operatively connected with said support structure and having a second end that is extendable outwardly with respect to said support structure;

an outer boom having an inner end that is disposed proximal to said second end and having an outer end;

hinge means, having an inner half that is attached to said inner boom proximal to said second end, and having an outer half that is attached to said outer boom proximal to said inner end and that is pivotally connected to said inner half, for permitting relative rotation of said booms about a pivot axis, and for allowing said outer boom to swing rearwardly from an outward position;

urging means for resiliently urging said outer boom toward said outward position,

stop means for limiting movement of said outer boom rearwardly from said outward position to a second position; and

means for obviating said stop means, whereby said outer boom may be rotated rearwardly beyond said second position.

4,200,256

APPARATUS MOUNTING ARRANGEMENT FOR AVOIDING HARM DUE TO SEISMIC SHOCKS

Peter H. Thiel, Bloomington, Ind., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

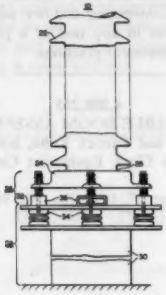
Filed Mar. 14, 1977, Ser. No. 777,260
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—548 3 Claims

1. A mounting arrangement, for supporting apparatus relative to the ground while avoiding harmful effects of ground

shocks such as due to earthquakes, on the apparatus, comprising:

spring means for supporting the apparatus and for permitting relatively minor reproducible movement of the apparatus which is within predetermined safe limits;

yieldable frame means for supporting said spring means, said frame means yielding, in a ductile failures mode, upon occurrence of movement exceeding that which can be absorbed by said spring means before damage to the apparatus;



said spring means comprising at least one spring element stacked on an anchor bolt and bearing against a portion of the supported apparatus, said anchor bolt being substantially vertically disposed between a fixed support and the supported apparatus; and

said yieldable frame means comprising a frame member disposed on said anchor bolt and having a first portion bearing against said at least one spring element and a second portion bearing against said fixed ground support.

4,200,257

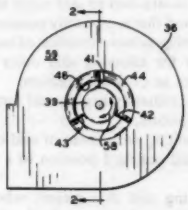
TORSIONAL VIBRATION ISOLATING MOTOR MOUNTING SYSTEM, MOUNTING ARRANGEMENT, ASSEMBLIES INCLUDING THE SAME

Ernest W. Litch, III, Ft. Wayne, Ind., assignor to General Electric Company, Ft. Wayne, Ind.

Division of Ser. No. 636,547, Dec. 1, 1975, Pat. No. 4,063,060. This application Sep. 1, 1977, Ser. No. 829,666

Int. Cl.[2] F25D *19/00*

U.S. Cl. 248—604 **25 Claims**



1. A torsional mode vibration isolating motor mounting system for an electric motor having a longitudinally extending shaft defining a longitudinally extending rotational axis and a stationary housing and adapted to be supported by a mounting surface, the system comprising: a plurality of mounting arms attached to the housing at circumferentially spaced apart locations and projecting generally radially from the housing relative to the rotational axis; each of said mounting arms comprising a flat sheet material member having a motor holding tab formed as a unitary part thereof and bent to extend from a first extremity thereof; each of said mounting arms further comprising a mounting portion formed as a unitary part thereof at a second extremity thereof; each said mounting portion comprising means for promoting flexing movement of each arm in response to torsional vibrations and further comprising means for accommodating at least one resilient member with which each arm may be attached to a mounting surface for pivotal movement of each such arm relative to said mounting surface; the portion of each arm between the extremities thereof comprising a flat flexible arm portion having a width and preselected thickness less than said width; each said flexible arm portion being generally rectangular in cross-section in the central portion thereof and having the preselected thickness thereof oriented, along the entire extent thereof between the mounting portion and motor holding tab, in a direction generally transversely relative to the rotational axis; and wherein the means for accommodating at least one resilient member includes a fastener accommodating aperture for facilitating fastening of each of said arm directly to a mounting surface.

4,200,258

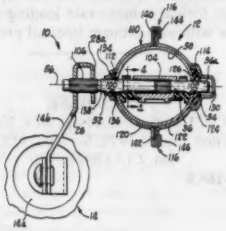
BUTTERFLY VALVE

Themistocles H. Gliatas, Worthington, Ohio, assignor to Ranco Incorporated, Columbus, Ohio

Division of Ser. No. 840,163, Oct. 7, 1977. This application Jun. 25, 1979, Ser. No. 51,842

Int. Cl.[2] F16K *1/226*

U.S. Cl. 251—214 **9 Claims**



1. A fluid flow controlling valve assembly comprising:

(a) a tubular valve body defining a through passage for fluid flow;

(b) a butterfly valving member supported within said valve body;

(c) a shaft extending transversely of said passage, said shaft drivingly connected to said valving member for rotating said valving member within said passage, said shaft defining spaced sections extending through openings in said valve body; and,

(d) shaft supporting means supporting said shaft for rotation within said openings and sealing against the escape of fluid from said valve assembly through said openings, said shaft supporting means comprising:

(i) band structure disposed about said body and defining first and second recesses aligned respectively with said openings, said recesses each defining a recess wall portion spaced outwardly from the valve body, said shaft portions extending into said respective recesses;

(ii) a resilient flexible element disposed within each of said recesses, each said resilient flexible element extending about an adjacent respective shaft section; and,

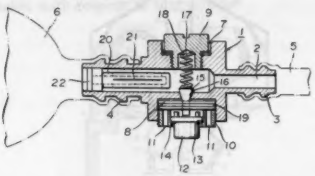
(iii) connecting means for securing said band structure about said valve body with said band structure compressively engaging each of said resilient flexible elements between said body and a respective recess wall portion, said elements urged into bearing engagement with said shaft sections.

4,200,259

PRESSURE RELIEF VALVE FOR BLOOD PRESSURE MEASURING INSTRUMENT

Kazuo Ueda, Tokyo, Japan, assignor to Ueda Works Co., Ltd., Tokyo, Japan

Filed May 25, 1978, Ser. No. 909,568
Claims priority, application Japan, Jun. 27, 1977, 52-99353[U]
Int. Cl.[2] F16K 1/52; A61B 5/02
U.S. Cl. 251—285 5 Claims



1. A pressure relief valve for a blood pressure measuring instrument comprising a valve housing having a hollow space forming an air passage, a discharge mechanism on the housing for selectively discharging a small or large amount of compressed air through the air passage, the discharge mechanism including a valve seat consisting of an outwardly converging tapered hole providing communication between the air passage in the valve housing and the outside thereof, a valve member shiftable between a position in contact with the valve seat and a position apart therefrom, a head portion of the valve member protruding above a lower surface of said valve housing, a valve closing spring interposed between an upper surface forming a hollow space in the valve housing and the valve member, a recess formed in the valve housing, an adjustment screw plug threadedly interengaged with the recess and having exhaust holes formed therein, a push button disposed in the adjustment screw plug in a manner that the push button is permitted to move upward and downward for a restricted distance and can open or close the valve member in cooperation with the spring in contact with the head portion of the valve member, the adjustment screw plug being rotatable to push the push button downwardly thereby making it possible to automatically discharge small amounts of compressed air at the decrease during the measurement of blood pressure, and direct pushing of the push button causing the remaining cuff pressure to quickly discharge after the measurement of blood pressure.

4,200,260

PICKET FENCE STRUCTURE

Thomas C. Dailey, 11714C E. 21st Pl., Tulsa, Okla. 74129, and Robert C. Dailey, 5200 S. Yale-Suite 306, Tulsa, Okla. 74135

Filed Mar. 20, 1978, Ser. No. 887,960
Int. Cl.[2] E04H 17/16
U.S. Cl. 256—24 5 Claims

1. A fence structure comprising:

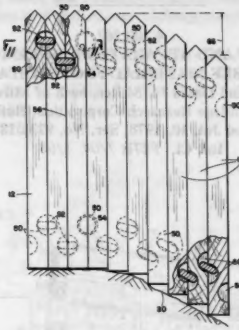
(a) a plurality of elongated pickets oriented parallel to each other;

(b) at least one first key slot cut part way into one edge of each picket, at least one second key slot cut part way into the opposite edge of each picket and being longitudinally offset from the first key slot, each key slot having width less than the thickness of the picket;

(c) the position of said key slots on mating edges of adjacent pickets being in substantial transverse alignment;

(d) a plurality of keys adapted to be placed and held, one in each pair of aligned key slots;

(e) wherein each said key slot comprises a semi-circular key slot cut into the edge of each picket, said key slot positioned symmetrically with respect to the two edges, and of depth substantially equal to the radius of said semi-circle, and wherein each of said keys is a circular disc of



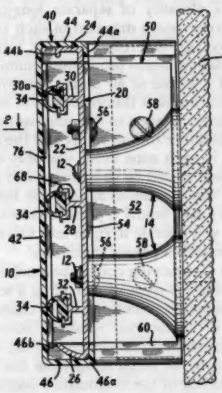
thickness substantially equal to the width of said semi-circular key slot.

4,200,261

HANDRAIL AND CRASH RAIL

Gary F. Bartlett, Muncy, Pa., assignor to Construction Specialties, Inc., Cranford, N.J.

Filed Dec. 18, 1978, Ser. No. 970,325
Int. Cl.[2] E04H 17/14
U.S. Cl. 256—59 9 Claims



1. In a handrail and crash rail which includes a substantially rigid elongated retainer of uniform cross section along its length and having in cross section a medial portion and upper and lower flanges and a cover of a resilient impact-resistant polymeric material having an impact wall portion and upper and lower flanges joined integrally to the impact wall portion, the respective upper and lower flanges of the retainer and cover being in engagement so that the cover is held on the retainer and the medial portion of retainer and the impact wall portion of the cover being spaced-apart to allow deflection of the cover toward the retainer upon impact, the improvements wherein there is a rib on the retainer located about midway between the retainer flanges, projecting toward the cover from the medial portion of the retainer and imparting longitudinal rigidity thereto, wherein there is at least one longitudinally extending resilient compressible cushion mounted on the rib and engaging the impact wall portion of the cover, and wherein there are clearances between the front surfaces of the retainer flanges and the portions of the cover outwardly therefrom so that the impact wall portion of the cover can deflect

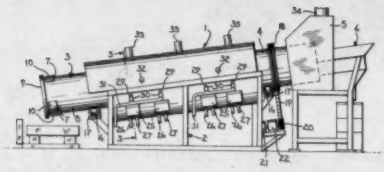
toward the retainer throughout its vertical extent upon impact and is restored to its initial position by the cushion.

4,200,262

METHOD AND APPARATUS FOR REMOVING COMBUSTIBLE MATERIAL FROM METAL SCRAP

Marvin Evans, and David H. Miller, both of Milwaukee, Wis., assignors to College Research Corporation, Butler, Wis.

Filed Jul. 10, 1978, Ser. No. 923,018
Int. Cl.[2] F27B 7/04, 7/08
U.S. Cl. 266—44 5 Claims



1. An apparatus for removing a combustible contaminant from metal scrap, comprising an inclined rotatable retort, feeding means for feeding the metal scrap containing the combustible contaminant into the upper end of the retort, discharge means for discharging the treated scrap after removal of the contaminant from the lower end of the retort, an outer housing spaced outwardly of the retort to provide an annular chamber therebetween, and including a refractory lining extending substantially the full length of the housing, said chamber being divided into a plurality of separate longitudinally disposed zones, fuel burner means disposed in each zone for burning a fuel to thereby heat the retort and the scrap moving therethrough, air conduit means providing communication between each zone and a source of air under pressure, valve means in said air conduit means, a thermocouple in each zone and disposed in proximate relation to the outer surface of the retort to sense the temperature of said retort and the scrap therein, the thermocouple in each zone being operably connected to said burner means and to said valve means of that zone whereby the thermocouple will operate to actuate the burner means when the temperature falls below a preset minimum value and said thermocouple will operate to open said valve means when the temperature exceeds a pre-set maximum.

5. A method of removing combustible substances from metal scrap, comprising the steps of providing a series of longitudinally spaced separate refractory lined chambers around the outer surface of an inclined rotatable retort, feeding scrap containing a combustible substance into the upper end of the retort, discharging the metal scrap from the lower end of the retort after removal of the combustible substance, sensing the temperature in each of said chambers, separately heating the portions of the retort within each of the chambers to volatilize the combustible substance when the temperature in that chamber is below a pre-set minimum, and impinging a cooling gas directly against the outer surface of the retort in each chamber when the temperature in that chamber is above a preset maximum, whereby the temperature of the metal scrap will be maintained within a predetermined range in each of said chambers.

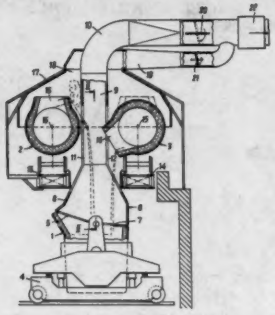
4,200,263

FILLING STAND ARRANGEMENT FOR A METALLURGICAL LADLE

Friedrich Laimer, Kerngraben, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Apr. 12, 1978, Ser. No. 895,643
Claims priority, application Austria, Apr. 22, 1977, 2831/77
Int. Cl.[2] C21C 5/40
U.S. Cl. 266—142 5 Claims

1. In a filling stand arrangement for a metallurgical ladle having a ladle mouth and being movable to said filling stand arrangement, said filling stand arrangement including at least one delivery device for molten metal, a hood covering said ladle mouth and having at least one recess for pouring in said molten metal from said delivery device, and first exhaust conduit means connected directly to said hood, the improvement comprising a flue dome provided above said at least one deliv-



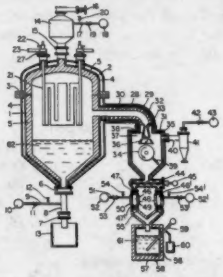
ery device when said delivery device is in its pouring position, said flue dome connected to said first exhaust conduit means via a second exhaust conduit means and completely covering said at least one recess provided in said hood and said at least one delivery device, said hood being positioned closely adjacent said ladle mouth and said recess being designed as a slot penetrating a side wall of said hood.

4,200,264

APPARATUS FOR OBTAINING MG AND CA THROUGH CARBON REDUCTION

Fumio Hori, 23, 15ban, Kentanicho, Nishinomiyashi, Hyoken, Japan

Division of Ser. No. 824,081, Aug. 12, 1977, Pat. No. 4,147,534.
This application Jun. 28, 1978, Ser. No. 919,805
Claims priority, application Japan, Aug. 16, 1976, 51/98012
Int. Cl.[2] C22B 45/00
U.S. Cl. 266—149 5 Claims



1. An apparatus for obtaining a metal selected from the group consisting of Mg, Be, Sr, Ba and Ca through carbon reduction of its oxide at elevated temperature comprising:

(a) a reaction chamber;

(b) means for controlling the temperature and pressure of said reaction chamber at a first condition whereby reaction between one said oxide and carbon is enabled to form the metal alone in vapor form and CO and wherein said metal in vapor form and CO can coexist without substantial reverse reaction;

(c) divergent nozzle means effective to adiabatically expand the mixture of said metal in vapor form and said CO from

said first condition to a second condition of pressure and lower temperature, said second condition being such that said metal and said CO coexist without substantial reverse reaction;

(d) said divergent nozzle means being operative to eject the gaseous mixture of said metal in vapor form and said CO in a condition of under expansion;

(e) collecting means exposed at least to the metal in vapor form ejected from said divergent nozzle; and

(f) said collecting means having a collector surface which is moveable with respect to said nozzle.

4,200,265

FURNACE FOR THE MELTING AND REFINING OF COPPER

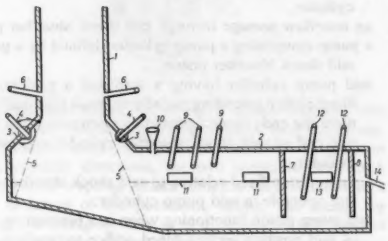
Gerhard Berndt, Seevetal; Gerhard Kapell, Jesteburg; Anton Schummer, and Jens U. Hansen, both of Hamburg, all of Fed. Rep. of Germany, assignors to Norddeutsche Affinerie, Hamburg, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,437

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735808

Int. Cl.[2] F27B *19/02*

U.S. Cl. 266—212 **10 Claims**



1. An apparatus for melting and refining copper, comprising:

a hearth furnace having a discharge side;

a shaft furnace surmounting said hearth furnace remote from said discharge side and formed unitarily with said hearth furnace, said shaft furnace being disposed relative to said hearth furnace such that a copper pile is formed on the bottom of the hearth furnace below the shaft furnace and slopes toward a portion of the hearth furnace disposed outside the vertical projection of the shaft furnace on the bottom of the hearth furnace;

a downwardly extending partition dividing said hearth furnace into two portions between said shaft furnace and said discharge side;

burners in the region of the junction between the shaft furnace and the hearth furnace and trained upon at least one flank of the copper pile formed on the bottom of the hearth furnace;

means provided between said partition and said pile for feeding an oxidizing gas into one of said portions proximal to said shaft furnace; and

means for introducing a poling gas into a melt of copper in said hearth furnace in the portion on the opposite side of said partition and distal from said shaft furnace.

4,200,266

MIXING ARRANGEMENT

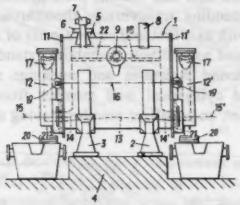
Ernst Riegler, Enns, and Manfred Schmidt, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 18, 1978, Ser. No. 934,945

Claims priority, application Austria, Sep. 2, 1977, 6322/77

Int. Cl.[2] B22D *35/00*; **C21B** *11/00*

U.S. Cl. 266—236 **12 Claims**



1. A mixing arrangement, in particular a pig iron mixer, comprising

a mixing chamber having a bottom and at least one passage provided near said bottom,

at least one pouring chamber detachably connected to said mixing chamber via said passage, said at least one pouring chamber, while connected to said mixing chamber, being pivotable relative to said mixing chamber about a pivot axis, said pivot axis extending near said bottom of said mixing chamber, and

slide locking means in said at least one passage of said mixing chamber for sealing said passage at least when the pertaining pouring chamber is detached from said passage.

12. A mixing arrangement, in particular a pig iron mixer, comprising

a mixing chamber having a bottom and at least one passage provided near said bottom,

at least one pouring chamber detachably connected to said mixing chamber via said passage, said at least one pouring chamber, while connected to said mixing chamber, being pivotable relative to said mixing chamber about a pivot axis, said pivot axis extending near said bottom of said mixing chamber,

slide locking means in said at least one passage of said mixing chamber for sealing said passage at least when the pertaining pouring chamber is detached from said passage, and

a bob weight provided on said at least one pouring chamber, said bob weight being positioned diametrically opposite said at least one pouring chamber along its pivot axis, said at least one pouring chamber, when filled with pig iron, and said bob weight having a common center of gravity, said common center of gravity being below said pivot axis of said at least one pouring chamber in the vertical position thereof.

4,200,267

TANDEM AXLE SUSPENSION WITH IMPROVED EQUALIZER PIVOT ASSEMBLY

John B. King, Springfield, Mo., assignor to Hutchens Industries Inc., Springfield, Mo.

Filed Sep. 12, 1978, Ser. No. 941,579

Int. Cl.[2] B60G *11/04*

U.S. Cl. 267—52 **5 Claims**

1. A tanden axle suspension for a vehicle frame including front and rear spring means for resiliently supporting front and rear transversely extending axles respectively, mounting means for supporting the front and rear ends of said front and rear spring means respectively, and equalizer means for supporting the rear and front ends of said front and rear spring means respectively, said equalizer means including an equalizer

bracket adapted to be attached to the vehicle frame, said bracket including a pair of transversely spaced bracket plates having longitudinally spaced first and second pairs of transversely aligned apertures extending transversely therethrough, a cylindrical wall member disposed between said bracket plates with its axis disposed parallel to and between the longitudinally spaced axes of said first and second pairs of apertures, an end disk adjacent each end of said cylindrical wall member and the associated bracket plate, said end disks having longitudinally spaced first and second pairs of transversely aligned openings extending transversely therethrough in transverse alignment with said first and second pairs of apertures respectively, first and second bolt assemblies extending through said first and second apertures and openings respectively and through said cylindrical wall member fixedly securing the same together, an equalizer member having a cylindrical wall

portion disposed in surrounding relation to said cylindrical wall member, and a resilient annular member between the exterior periphery of said cylindrical wall member and the interior periphery of said cylindrical wall portion, the improvement in combination therewith which comprises said cylindrical wall member including a plurality of annularly spaced recesses formed in opposite end portions thereof defining a plurality of annularly spaced axially extending projections at each end portion thereof, each of said end disks having a plurality of annularly spaced recesses formed in the exterior periphery thereof defining a plurality of annularly spaced radially extending projections, each of said end disks being mounted with the radial projections thereof engaged within the recesses within the associated end portion of said cylindrical wall member and with the recesses thereof receiving the associated axially extending projections of said cylindrical wall member.

4,200,268

SHOCK-ABSORBER

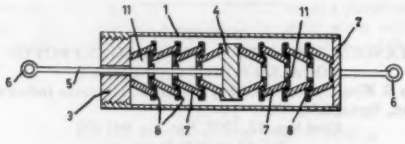
Eduard Wiek, 16 Horstlindelaan, Enschede, Netherlands

Filed Jun. 15, 1978, Ser. No. 915,878

Claims priority, application Netherlands, Jun. 17, 1977, 7706697; Dec. 23, 1977, 7714348

Int. Cl.[2] F16F *3/08*

U.S. Cl. 267—63 R **15 Claims**



1. A shock absorber comprising a piston centrally and moveably positioned in a cylinder, a plurality of conically shaped deformable shock absorbing bodies located about the central longitudinal axis of said cylinder on each side of said piston and a plurality of circular nondeformable dics each disc being arranged between two of said conically shaped shock absorbing bodies.

4,200,269

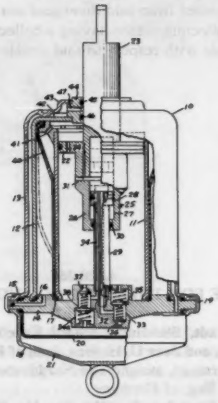
SELF ADJUSTING SHOCK ABSORBER

George C. Ludwig, 845 Whitehall Cir. South, Florence, S.C. 29503

Filed Dec. 8, 1977, Ser. No. 858,617

Int. Cl.[2] B60G *17/00*

U.S. Cl. 267—65 D **3 Claims**



1. A self adjusting shock absorber comprising

a shock absorber cylinder,

a shock absorber piston movable in said cylinder and having a shaft extending externally of said cylinder,

a reservoir associated at least in part with one end of said cylinder,

an interflow passage through said shock absorber piston,

a pump comprising a pump cylinder defined by a portion of said shock absorber piston,

said pump cylinder having a wall and a position sensing bleed orifice extending radially through said wall intermediate the ends thereof providing communication between one end of said shock absorber cylinder and said pump cylinder,

a pump piston fixed relative to said shock absorber cylinder and operable in said pump cylinder,

said pump piston functioning when in a position on one side of said position sensing bleed orifice to produce a pump "down" cylinder and when operating on the other side of said position sensing bleed orifice to provide a pump "up" cylinder with the end of said pump cylinder,

a piston rod connected to said pump piston and extending through one end of said pump cylinder,

said shock absorber cylinder including an end wall to which said piston rod is connected so that the piston rod is stationary relative to said shock absorber cylinder,

said pump piston, piston rod, and end wall having a first passage extending therethrough and providing communication between one end of said pump cylinder on said one side of said position sensing bleed orifice and a first chamber in said end wall communicating with said shock absorber cylinder and said reservoir,

said piston rod and end wall having a second passage extending therethrough and providing communication between the other end of said pump cylinder on said other side of said position bleed orifice and a second chamber in said end wall communicating with said shock absorber cylinder and said reservoir,

a pump up inlet check valve in said first chamber operable to permit flow from said reservoir,

a pump up outlet check valve in said first chamber operable to permit flow to said shock absorber cylinder,

a pump down inlet check valve in said second chamber

operable to permit flow from said shock absorber cylinder, and

a pump down outlet relief valve in said second chamber operable only at a predetermined pressure above the normal operating pressure in said shock absorber cylinder to permit flow to said reservoir.

4,200,270

PNEUMATIC SPRING, ESPECIALLY FOR VEHICLES

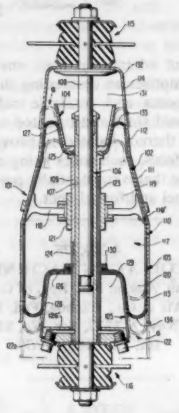
Josef Merkle, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,800

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1977, 2750666

Int. Cl.² F16F 3/08

U.S. Cl. 267—65 B **51 Claims**



1. A pneumatic spring for vehicles which includes two supports, at least one closed spring volume, two spring surfaces of different sizes adapted to be subjected to pressure acting in opposite directions, the two spring surfaces each having an effective spring surface which is variable in size as a function of travel of the pneumatic spring, and means for supporting the spring surfaces so as to be coaxial with respect to one another, characterized in that a casing is provided, two roll bellows means are arranged in the casing and form the spring surfaces, each of the roll bellows means defining a partial volume of the at least one closed spring volume, the supporting means includes a pair of spring piston means associated with the respective roll bellows means, the spring piston means and the casing of the pneumatic spring form at least a portion of the two supports, and in that means are provided for separating the partial volumes defined by the two roll bellows means from each other so as to maintain the respective partial volumes essentially independent of the travel of the pneumatic spring.

4,200,271

WORK TABLE

Arthur August, Smithtown, and John G. Huber, Sayville, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Division of Ser. No. 814,472, Jul. 11, 1977, Pat. No. 4,133,711. This application May 1, 1978, Ser. No. 901,525

Int. Cl.² B23Q 3/00

U.S. Cl. 269—21 **3 Claims**

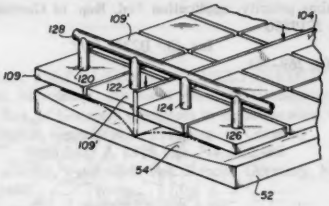
1. For use as one station of an assembly line for creating a patterned structure, a work table comprising:

a fixed support;

a table base mounted to said fixed support so as to be slidable on and relative to said fixed support;

a modular vacuum supporting surface; and

a means to support the modular vacuum supporting surface horizontally on said table base, said means including side-



ward actuation devices to move said surface and said base laterally of said fixed support, said means further including rotary actuator means to rotate said surface from a position of rest on said base through 180° to a position to the side of said base to transfer articles on said surface to the side of said line.

4,200,272

HOLDER FOR IRREGULARLY SHAPED ARTICLES

Ronald G. Godding, Birmingham, England, assignor to BCIRA, Birmingham, England

Filed Jun. 12, 1978, Ser. No. 914,620

Int. Cl.² B25B 11/00

U.S. Cl. 269—26 **6 Claims**

1. In a work holder for locating a workpiece of irregular shape during treatment, said holder comprising a flat horizontal table and a two-dimensional array of vertically disposed spaced-apart rods mounted to be vertically movable in relation to said table and protrudable upwards through said table, the improvement which comprises upper and lower horizontal table surfaces through which said rods protrude upwards, there being a working clearance between each of said rods and each said surface, said first and second horizontal surfaces defining therebetween a plenum chamber, and means for admitting air under pressure to said chamber whereby to produce an upward flow of air through said clearance between each of said rods and said upper table surface to prevent the ingress of debris from a workpiece supported by said rods.

4,200,273

DEVICE FOR MAINTAINING GAS TURBINE ENGINES, MORE PARTICULARLY GAS TURBINE JET ENGINES

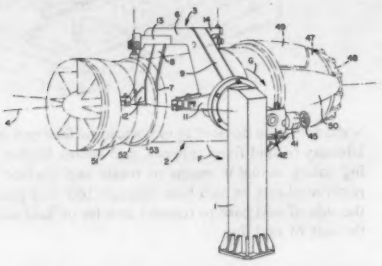
Arun-Kumar Das Gupta, and Franz Seidl, both of Munich, Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Fed. Rep. of Germany

Filed May 4, 1978, Ser. No. 902,849

Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719850

Int. Cl.[2] B23Q *3/18*

U.S. Cl. 269—61 **27 Claims**



1. A support stand arrangement for a gas turbine engine, more particularly, a turbo-jet engine, the arrangement comprising:

a single support anchored base column,

yoke means surrounding over about one-half of a circumference of the engine for supporting the engine at the base column,

means for mounting said yoke means as a cantilever arm to said base column so as to be rotatable from a horizontal position to and from a vertical position about an axis of rotation extending at right angles to a center line of the engine,

a first supporting arm means connected at a free end of said yoke means at a first lateral side of the engine and extending approximately parallel to a vertical longitudinal center plane of the engine,

a second supporting arm means connected to said yoke means at a second lateral side of the engine and extending approximately parallel to a vertical longitudinal center plane of the engine,

a third and fourth supporting arm means respectively disposed on a forward and rearward side of the yoke means, said third and fourth supporting arm means being arranged in the vertical longitudinal center plane of the engine,

means are provided on the outer ends of each of said supporting arm means for at least one of locating and connecting the engine to said supporting arm means, said locating and connecting means provided on the first and second supporting arm means and on the third supporting arm means forming a three-point suspension system for the engine with suspension points of the suspension system lying at least approximately in a plane which extends parallel to respective positions of the yoke means as said yoke means is rotated about said axis of rotation.

4,200,274

FIXTURE FOR HOLDING A FACEPLATE AND A FUNNEL OF A CRT DURING SEALING

Clarence C. Turner, Marion, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 19, 1978, Ser. No. 952,776

Int. Cl.[2] B23Q *3/00*

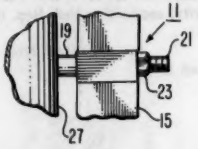
U.S. Cl. 269—319 **8 Claims**

1. In a fixture for supporting and aligning the faceplate and funnel of a cathode-ray tube while they are being sealed together, said fixture comprising

(a) a base,

(b) means on the base for supporting the faceplate and the funnel in abutting relationship,

(c) and a plurality of alignment structures so attached to and positioned on said supporting means that a faceplate and an abutting funnel present in said supporting means are aligned when they bear against prescribed alignment surfaces of said alignment structure,



the improvement wherein at least one of said alignment structures comprises an upstanding shaft attached to said supporting means and rotatable rollers nonadjustably mounted on said shaft and oriented with peripheral surface portions thereof located to provide said prescribed alignment surfaces, each roller being rotatable about said shaft in a plane that is substantially parallel to the plane in which the panel and funnel abut.

4,200,275

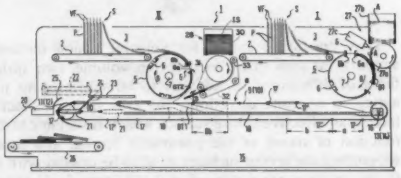
COLLATING MACHINE

Jochen Wangermann, Appen, Fed. Rep. of Germany, assignor to Gruner & Jahr AG & Co., Itzehoe, Fed. Rep. of Germany

Filed Nov. 2, 1977, Ser. No. 847,895

Int. Cl.[2] B42B *2/00*

U.S. Cl. 270—53 **7 Claims**



1. A collating machine for gathering a plurality of folded sheet product into a complete product, each of said plurality of product being folded into folded portions, said collating machine comprising:

a frame;

conveying means mounted to said frame for carrying said folded sheet product in only one predetermined conveying direction, said conveying means having two continuous drive elements mounted to said frame and a forward turn-round end, said drive elements moving in spaced drive planes, respectively;

a plurality of driver bars spaced between said two continuous drive elements, said plurality of driver bars extending perpendicular to said conveying direction and perpendicular to said spaced drive planes of said continuous drive elements;

means for mounting said two continuous drive elements to said frame;

means for stitching said complete product mounted adjacent to said forward turn-round end of said conveying means, said stitching means further being mounted transverse to said spaced drive planes for stitching said complete product in the conveying direction of both drive elements, said stitching means further comprising a reciprocally mov-

able counter-piece member located adjacent to said stitching means such that the driver bars may pass between said counter-piece member and said stitching means, said counter-piece member further being movable into said folded sheet product to cause said folded sheet product to move towards said stitching means;

means for reciprocally moving said counter-piece member with respect to the drive elements and drive bars, said moving means located adjacent said frame for cooperation therewith;

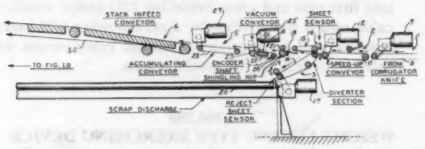
first means for delivering a plurality of said folded sheet product to said driver bars, said first delivery means mounted above said conveying means and having an axis of orientation extending substantially horizontal and perpendicular to said conveying direction, such that said folded sheet product is deposited on said driver bars with the fold leading, while said folded sheet product surrounds a respective driver bar; and

at least one additional means for delivering a plurality of said folded sheet product to said driver bars, said at least one additional delivery means mounted above said conveying means, each of said at least one additional delivery means having an axis of orientation extending substantially horizontal and perpendicular to said conveying direction, such that said folded sheet product is deposited on the folded sheet product delivered by said first delivery means in timed relationship to said first delivery means, said folded sheet product of said at least one additional delivering means being deposited on said folded sheet product of said first delivery means with the fold leading, while said folded product surrounds the product previously delivered by said first delivery means, such that as said first and at least one additional delivery means deliver said folded sheet products, said conveying means gathers said sheet product into said complete product, which is stitched by said means for stitching.

4,200,276
SHINGLING AND STACKING OF CONVEYED SHEET MATERIAL

Carl R. Marschke, Phillips, Wis., assignor to Marquip, Inc., Phillips, Wis.

Filed May 15, 1978, Ser. No. 906,059
Int. Cl.² B65H *29/66*
U.S. Cl. 271—279 **13 Claims**



1. A method of handling sheets conveyed in succession from a sheet source to a stacker where a vertical stack of a predetermined number of sheets is to be formed, and wherein the sheets being conveyed are in-line and initially traveling at a first speed on an input conveyor, comprising the steps of:

(a) sensing the number of said sheets passing a first location between said input conveyor and said stacker,

(b) shingling said sensed sheets at a second location downstream of said first location while slowing the sensed sheets to a second speed,

(c) conveying said shingled sheets from said second location to said stacker at said second speed,

(d) increasing the speed of all of said shingled sheets to a third speed upon the sensing of said predetermined number of sheets passing said first upstream location to separate said sheets into a stack-forming group,

(e) slowing the sheets upstream of said group to a fourth speed in response to the passage of the trailing end of said group by at least one predetermined point,

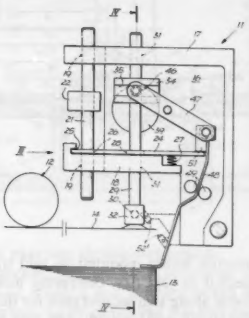
(f) discharging the stack ultimately formed from said group from the stacker,

(g) and then increasing the speed of said slowed upstream sheets to said second speed downstream of said second location.

4,200,277
FLAT PILE-AUTOMATIC SHEET FEEDER

Emil Klenk, Murrhardt, and Adolf Hornung, Reichenberg, both of Fed. Rep. of Germany, assignors to Maschinenbau Oppenweiler GmbH, Oppenweiler, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,486
Claims priority, application Fed. Rep. of Germany, May 12, 1977, 2721442
Int. Cl.² B65H *3/08*
U.S. Cl. 271—90 **10 Claims**



10. In an automatic sheet feeder for lifting sheets from a flat pile of sheets and feeding them further with a sheet separator which has at least one suction means, at least one sensor and a shaft means, the shaft means during rotation moving and returning the suction means from a rest position which is lifted off the pile into a suction position lying on the flat pile and moves and returns the sensor from a sensing position lying on the flat pile into a release position swung out of the way of the sheet lifted from the flat pile, and with a removal device pulling-off the sheet which is lifted by the suction means, the improvement comprising

a continuously operating means for rotating the shaft means when operatively coupled therewith,

means for operatively coupling the shaft means to said continuously operating means when no sheet is sucked on the suction means in the rest position until, and for decoupling the shaft means from said continuously operating means only when, said suction means with a sucked sheet thereon occupies the rest position again.

4,200,278
SORTING APPARATUS FOR REPRODUCTION MACHINE PRODUCING SIMPLEX AND DUPLEX COPIES

Eridiano Gindri, Ivrea, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Feb. 6, 1978, Ser. No. 875,291
Claims priority, application Italy, Feb. 18, 1977, 67357 A/77
Int. Cl.² B65H *39/10*
U.S. Cl. 271—296 **5 Claims**

1. Sorting apparatus for receiving sheets from a reproduction machine distributing in both simplex and duplex modes of operation, comprising:

a frame;

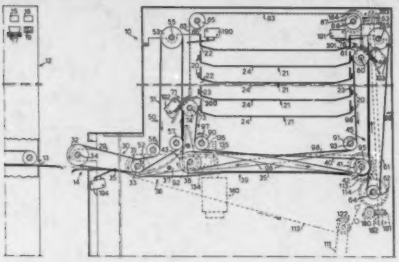
an array of regularly spaced tray members arranged along a

predetermined direction and fixedly connected to said frame;

single transport means defining a first path and a second path extending parallel to said predetermined direction, for selectively moving sheets, said first path being adjacent one side of said array and said second path being adjacent the opposite side of said array, said transport means extending along said one side and said opposite side of said array;

deflecting means for selectively deflecting sheets toward either said first or said second path according to whether simplex or duplex sorting is required;

first delivering means mounted on said transport means and incrementally movable along said first path for delivering sheets transported along said first path into a selected tray member of said array;



second delivering means mounted on said transport means and connected to said first delivering means, incrementally movable along said second path for delivering sheets transported along said second path into a selected tray member of said array;

connecting means connecting said first and second delivering means for incrementally moving them in opposite directions along said first and second paths respectively; and

single control means to control the incremental movement of said first and second delivering means, whereby, when said first delivering means moves along said first path for indexing said tray members according to one of two opposite predetermined sequences, according to whether simplex or duplex sorting is required, said second delivering means always indexes said tray member according to a sequence opposite to the indexing sequence of said first delivering means.

4,200,279

LEG EXTENSION, LEG CURL, HIP, THIGH, BACK AND BUTTOCKS MACHINE

Lloyd J. Lambert, Jr., Dynamics Health Equip. Mfg. Co. Inc., 1538 College Ave., South Houston, Tex. 77587

Filed Apr. 5, 1978, Ser. No. 893,615

Int. Cl.[2] A63B *21/00*

U.S. Cl. 272—118 **5 Claims**

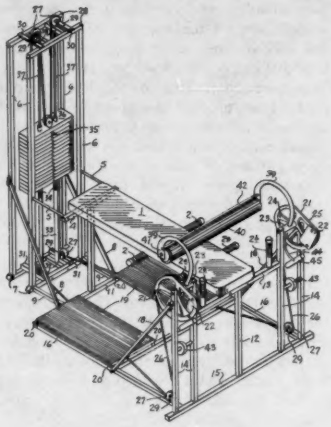
1. An exercise machine comprising in combination:

a first rectangular grid having a substantially medially disposed cross brace bar (17) interconnecting two members of said first grid, said first grid defining a bench support base,

a pair of vertical support columns (3,12) disposed on two members (15,11) forming said grid not interconnected by said cross brace bar, medially disposed having vertical extremities provided with horizontal bar elements (4,13) parallel with the lower last named two members (15,11) said horizontal bar elements carrying thereon an horizontal bench,

one of said last named two members (15) having two pairs of vertically disposed support bars (14) eminating therefrom at opposed extremities thereof for supporting cam means, said cam means comprising:

pins interconnecting each pair of support bars (14) remote from said first grid, a sleeve (23) thereover, a cam (21) on each sleeve having a substantially "D" shaped outer configuration and grooved on its outer periphery, spokes (24) connecting said outer periphery to a central portion of said cam, a plate member (22) on an outer portion of said cam to provide a first counterbalance, a second counterbalance connected to said sleeve defined by a first arcuate rod (44) connected to a cylindrical weight (45), a second arcuate rod (39) extending from said sleeve terminating in



a plate member (41), the plate members from each second arcuate rod (39) interconnected by a pair of parallel bar members, one of which has a padded roller (40) thereon,

a stop element between each pair of support bars (14) defined by a roller abuttment (43) to stop the arc of travel of said padded roller, cable means 26 attached to each said cam along its groove extending vertically downwardly to a pulley means (27) on said first grid, horizontally thereafter over said first grid to weight means,

and two platforms (19) disposed on feet (20) supported by said first grid and cross brace bar (17) under which said cable means travel whereby a person using said exercise machine will be removed from said cable means when entering or leaving the machine area.

4,200,280

WEIGHT LIFTING TYPE EXERCISING DEVICE

Max E. Goodwin, Valencia, Calif., assignor to Marcy Gymnasium Equipment Company, Glendale, Calif.

Continuation-in-part of Ser. No. 739,960, Nov. 8, 1976, abandoned. This application Oct. 25, 1978, Ser. No. 954,662

Int. Cl.[2] A63B *21/06*

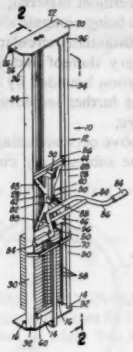
U.S. Cl. 272—118 **10 Claims**

1. In an exercising machine of the type having an upright supporting structure, vertical tracks associated with said upright supporting structure, a carriage which slides vertically upwardly and downwardly on said vertical tracks, said carriage being provided with a plurality of vertically spaced sockets, body-engaging means removably connected to the carriage at any selected one of said vertically spaced sockets, and adjustable resistance means associated with the carriage to bias the carriage and body-engaging means in a vertically downward direction, the improvement which consists of a body-engaging means comprising a lifting arm having:

(a) a socket-engaging portion having an open free end and

telescopically receivable in substantially a horizontal direction within the vertically spaced sockets; and

(b) a safety latching means carried by said socket-engaging portion and pivotally movable relative thereto about a transversely extending axis, said safety latching means having oppositely disposed first and second ends spaced on opposite sides of said axis, one of said ends being mov-



able by force of gravity automatically into latching engagement with the carriage upon insertion of said socket-engaging portion into the socket for locking said lifting arm against movement relative to said socket in a reverse direction thereby preventing accidental withdrawl from the socket and the other of said ends being engageable to move said opposite end out of latching engagement with the carriage.

4,200,281

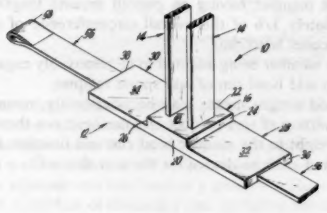
ELASTIC PULL TYPE EXERCISING DEVICE

Clifford Wang, 839 Newburg Ave., N. Woodmere, N.Y. 11581

Filed Oct. 13, 1977, Ser. No. 841,989

Int. Cl.² A63B *21/02*

U.S. Cl. 272—138 **10 Claims**



1. An exercising device comprising a base plate having channel means therein and slot means extending through said base plate to said channel means, elastic strap means including elastic straps having a handle member at one end of each strap and integral block-like lug means disposed at an opposite end thereof corresponding in shape to said channel means, said block-like lug means being retained in said channel means to secure said strap means to said base plate, said strap means passing through said slot means extending outwardly from said base plate, said base plate including an enlarged central portion and lateral extensions on either side thereof, said elastic strap means extending upwardly from said enlarged central portion, said lateral extensions each having a flat upper surface adapted to receive a user's feet while exercising with said elastic strap means, said strap means including two vertical elastic straps extending upwardly from said enlarged central portion, and two horizontal straps extending laterally outwardly from said lateral extensions.

4,200,282

MULTIPLE EXERCISER DEVICE

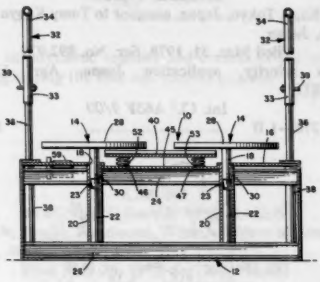
Ferenc I. Agyagos, Sangin Bldg., 3-21-5, Akasaka, Minato-ku, Tokyo, Japan

Filed Nov. 6, 1978, Ser. No. 957,842

Claims priority, application Japan, Dec. 16, 1977, 52/169248[U]; Dec. 16, 1977, 52/169249[U]; Feb. 3, 1978, 53/013247[U]; Feb. 3, 1978, 53/003741[U]; Feb. 3, 1978, 53/003742[U]

Int. Cl.² A63B *23/02*

U.S. Cl. 272—146 **19 Claims**



1. A multiple exerciser device comprising:

a raised supporting base having a horizontal top surface; a spring biased running and jumping board positioned on said top surface, said running and jumping board hinged at one side to said base; two removable rotatable exercising platforms having flat surfaces operatively connected to the top of said device and positioned above said running and jumping board, each of said platforms having a centrally positioned, vertically downward extending turning shaft; at least two vertically extending turning shafts receiving socket means, each of said socket means being adapted to removably receive one of said turning shafts, each of said turning shafts when positioned in one of said socket means providing a horizontally positioned flat platform surface rotatable over said running and jumping boards.

4,200,283

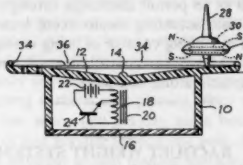
MAGNETIC SPINNING TOP GAME

Roger W. Andrews, and Melvin R. Andrews, both of Rte. 1, Box 303A3, Corvallis, Oreg. 97330

Filed Jan. 23, 1978, Ser. No. 871,360

Int. Cl.² A63H *1/00, 33/26*

U.S. Cl. 273—108 **9 Claims**



1. A spinning top game, comprising:

(a) a housing having a top spinner-supporting base which slopes inwardly to a depressed center,

(b) a magnet spinner arranged to be rotated upon the base,

(c) means in the housing for producing an intermittent magnetic field in the central area of the base for accelerating rotary movement of the spinner and for causing the spinner to move outward toward the periphery of the base, and

(d) at least one hazard on the base adjacent the outer, elevated periphery thereof for receiving a spinner and preventing it from returning toward the center of the base,

(e) the outer peripheral portion of the base containing the hazard sloping inwardly toward the depressed center at a lesser angle than the inner portion of the base.

4,200,284

GAME IN WHICH OBJECTS ARE DISCHARGED FROM A RECEPTACLE

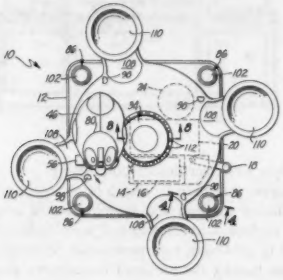
Takashi Kaga, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Mar. 31, 1978, Ser. No. 892,073

Claims priority, application Japan, Apr. 13, 1977, 52/46933[U]

Int. Cl.[2] A63F *9/00*

U.S. Cl. 273—1 R **17 Claims**



3. A game which comprises:

a base,

a receptacle located adjacent to said base, said receptacle having a discharge opening located in the bottom thereof,

discharge control means for controlling discharge of an item located within said receptacle through said discharge opening, said discharge control means being located on said receptacle and being capable of being actuated so as to permit discharge through said discharge opening, said discharge control means normally preventing discharge through said discharge opening, said discharge control means being capable of being actuated from the exterior of said receptacle so as to permit discharge through said discharge opening,

drive means for moving said receptacle along a continuous path, said drive means being located on said base and connecting said receptacle to said base,

actuating means for use in actuating said discharge control means so as to permit discharge through said discharge opening, said actuating means being located adjacent to said path and being capable of being manipulated so as to actuate said discharge control means during movement of said receptacle along said path.

4,200,285

RACQUET WEIGHT SYSTEM

Angelo Petitti, Jr., 2115 N. Sedgwick, Chicago, Ill. 60614

Filed Dec. 7, 1977, Ser. No. 858,363

Int. Cl.[2] A63B *69/38, 49/04*

U.S. Cl. 273—29 A **8 Claims**

1. An improved sports racquet and weight system comprising in combination,

a sports racquet of the type formed by a substantially circular head rim forming a boundary for said racquet;

said head rim having a strong surface carried within the boundary thereof;

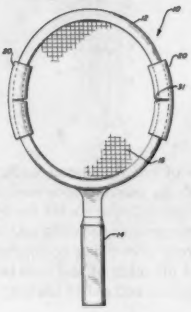
said head rim further including a handle portion extending outwardly therefrom;

weight means including at least one weight member formed by a weighted resilient material;

said weight means being elongate along the longitudinal axis and having a substantially circular configuration along the exterior periphery thereof and terminating in an interrupted neck portion bounded by opposed legs;

said weight means further including an interiorally cutout mounting groove;

said mounting groove corresponding with the external configuration of the substantially circular head rim of said sports racquet;



the legs bounding said neck portion being sufficiently resilient to stretch laterally a distance sufficient to permit said weight means to be positionally mounted on said head rim of said racquet with a portion of said head rim encased within said mounting groove of said weight means;

said weighted member having an overall weight of between 10 and 25 grams;

said weight member having an overall arcuate length of approximately 1/6 of the overall circumference of said sports racquet head rim;

said weight member being adapted to be removably engageable from said head rim of said sports racquet;

whereby said weight means may be positionally mounted along a portion of said racquet circular head rim thereby to add weight to the racquet head rim and function as a training and exercise device for the user thereof.

4,200,286

SET OF TORQUE-BALANCED GOLF CLUBS

Richard C. Bennett, 7333 Armitage Ave., Elmwood Park, Ill. 60635

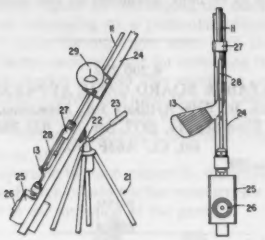
Filed Dec. 9, 1977, Ser. No. 859,031

Int. Cl.[2] A63B *53/04*

U.S. Cl. 273—77 A **2 Claims**

1. A set of at least four torque-balanced golfing clubs, each comprising a shaft and a head at one end thereof, the shafts of said clubs having different lengths, and the heads having different weights and different loft angles, the head of each club being adapted to rest on the ground such that a predetermined different angle is formed between the associated shaft and the ground, the weight distribution of each of said heads being

such that the torque of each club about its shaft axis with the club oriented at its associated predetermined angle being substantially the same as the corresponding torque of every other club in said set of clubs.



4,200,287

REMOTELY CONTROLLED MINIATURE VEHICLE

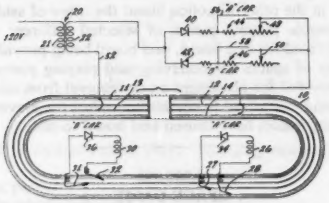
John W. Ryan, Los Angeles, and James D. Moore, Palos Verdes, both of Calif., assignors to Ideal Toy Corporation, Hollis, N.Y.

Continuation-in-part of Ser. No. 781,546, Mar. 28, 1977, abandoned, which is a continuation-in-part of Ser. No. 632,471, Nov. 17, 1975, abandoned. This application Feb. 16, 1978, Ser. No. 878,474

The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.

Int. Cl.[2] A63F *9/14;* A63H *18/12, 17/36*

U.S. Cl. 273—86 B 23 Claims



21. In a system embodying miniature electrically operated miniature vehicles which are remotely controlled, the system including a track for the vehicles having plural lanes and lateral walls and the vehicles being steerable to turn from a position adjacent one side wall to a position adjacent an opposite wall, a method of creating a race including the step of operating one additional obstacle vehicle on the track at an uncontrolled lower relatively constant speed than the other vehicles, and remotely controlling the other vehicles to steer around and pass said one vehicle whereby the controlled vehicles are restricted to passing the obstacle vehicle one at a time at a random time and location around the track circuit.

4,200,288

TOSS AND TUMBLE TOY

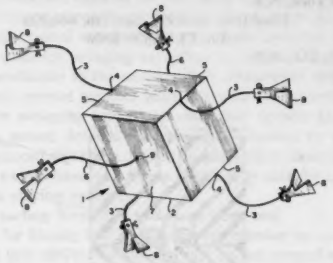
Jose J. di Donato, 3545 Island Park, Wantagh, N.Y. 11793

Filed Sep. 1, 1977, Ser. No. 829,788

Int. Cl.[2] A63B *65/00*

U.S. Cl. 273—428 6 Claims

1. A toss and tumble toy a body member having a pre-disposed geometric and artistic surface configuration, a plurality of tail like members attached to said body along the said surface at discrete locations thereon and flap members attached to the extremities of said tail like members the said tail, and flaps



providing aerodynamic stability and control of the toy when functioning during the toss and tumble process.

4,200,289

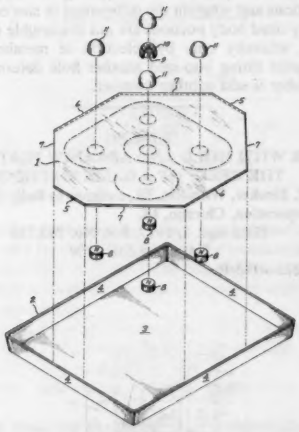
MAGNETIC GAME APPARATUS

Thurston N. Bosley, Lynnwood, Wash., assignor to Jemar, Inc., Renton, Wash.

Filed May 30, 1978, Ser. No. 910,422

Int. Cl.[2] A63F *7/16*

U.S. Cl. 273—109 12 Claims

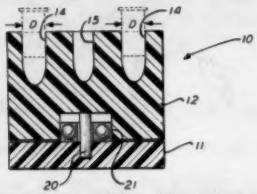


1. In a game apparatus, a generally horizontally disposed nonmagnetic playing surface having upper and lower sides, a plurality of magnets located beneath said playing surface, and a movable playing piece for traversing a circuitous path on said upper side of said playing surface in response to tilting of said playing surface, said playing piece including a magnet and having a convexly curved bottom for bearing on said upper side of said playing surface, said playing piece magnet being disposed such that when said playing piece bottom bears on said upper side of said playing surface one pole of said playing piece magnet is adjacent to said playing surface and the other pole of said playing piece magnet is farther from said playing surface so that said playing piece will revolve and wobble when said playing surface is tilted and the magnetic field of said playing piece magnet interacts with the magnetic field of said magnets beneath said playing surface.

4,200,290
GAME DEVICE

Frank S. Csoka, Sea Cliff, N.Y., assignor to Fun Things, Inc., New York, N.Y.

Filed Dec. 14, 1977, Ser. No. 860,328
Int. Cl.[2] A63F 9/08
U.S. Cl. 273—139 8 Claims

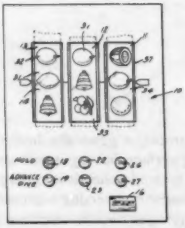


1. A game device comprising:
a base;
a body rotatably mounted on said base and being formed with a plurality of holes of a first size and another hole of a second size;
a plurality of members each of said members comprising a body portion and a enlarged top portion, said body portions being sized to be received in said plurality of holes but not fitting into said another hole; and another member comprising a body portion and a top portion, said another member body portion being differently sized from said body portions of said plurality of members so as to be received in both said plurality of holes and said another hole, said top portions comprising similarly appearing portions and wherein the differences in size of said differently sized body portions are not discernible to the naked eye, whereby only by selection of members with attempted fitting into said another hole determines which member is said another member.

4,200,291
DEVICE WITH HOLD AND ADVANCE FEATURE FOR THE REELS OF A GAME MACHINE

Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Apr. 1, 1977, Ser. No. 783,755
Int. Cl.[2] A63F 5/04
U.S. Cl. 273—143 R 2 Claims

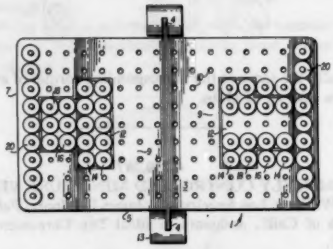


1. A player actuated game machine having a housing with a plurality of rotatable reels each with more than one indicia visible through a window having a play cycle wherein the machine is first enabled by the player, after which the player can be choice selectively hold or advance by one indicia position one or more of said reels, after which said player can start the machine and each of said reels which have been selected to be held will remain stationary, each of said reels which have been selected to advance one indicia will advance one indica, and the remaining reels will spin freely to end the play cycle, the improvement comprising, player actuated means for holding at least one of said reels, player actuated means for advancing one indicia at least one of said reels, reel drive means coupled to said reels, and player actuated start means for causing said reels to be held, advanced by one indicia or to spin freely.

4,200,292
TILTABLE BOARD GAME APPARATUS

Jack B. Slimp, Jr., 8700 Artillery Rd., Manassas, Va. 22110

Filed Sep. 14, 1977, Ser. No. 833,284
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—258 10 Claims

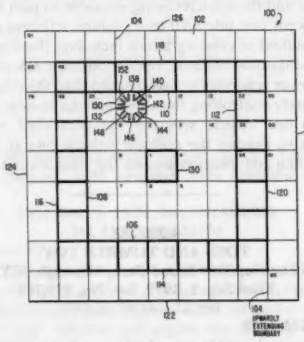


8. A game device which comprises in combination a substantially flat game board comprising two symmetrical portions with an axis passing through the board's center of gravity comprising a boundary between said portions, a projection from said board extending therefrom, said projection defining a pair of parallel axes spaced below said board which are parallel to and spaced an equal a distance on each side of said first mentioned axis, a surface receiving said pair of axes, said board being tiltable in one direction about one of said pair of axes and in the other direction about the other of said pair of axes, movable playing pieces of selected different weights being provided for said board, said board being provided with a plurality of spaces for receiving said playing pieces, point pieces provided for placement on or removal from said board for restoring said board to equilibrium when the movement of said playing pieces have caused said board to tilt.

4,200,293
SPACE GAME

Harry Benson, III, 4824 W. 133rd St., Hawthorne, Calif. 90250

Filed Jun. 5, 1978, Ser. No. 912,372
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—260 4 Claims



1. A board game comprising:
(a) a gameboard having disposed thereon a playing field

including a generally square area of individual spaces forming said playing field, said spaces forming increments of travel;

(b) a plurality of sets of marker members each set having identification means for identifying the marker members of that set belonging to a particular player, each said marker member having eight sides with indicators disposed adjacent each said side for indicating the number of spaces said marker member may move in a predetermined direction and wherein said identification means comprise a series of indentations adjacent each said side and a predetermined number of indicator members disposed in said indentations; and

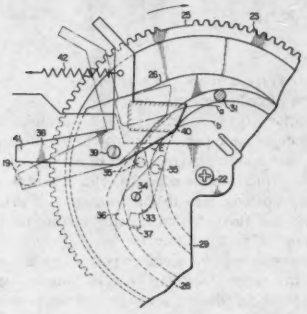
(c) means operable by each player for identifying the space upon which each of said marker members for each said set is placed at the inception of the game.

4,200,294

AUTOMATIC RECORD PLAYER CAPABLE OF CHANGING DISCS AUTOMATICALLY

Kenji Takeda, Ozu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 28, 1978, Ser. No. 937,426
Claims priority, application Japan, Aug. 29, 1977, 52-103934
Int. Cl.² G11B 17/16
U.S. Cl. 274—10 R **2 Claims**



1. An automatic record player changing mechanism comprising:

a base plate;

a cylindrical shaft fixed to said base plate;

a turn table rotatably mounted onto said cylindrical shaft;

a cylindrical spindle body received in said cylindrical shaft and having a plurality of axial slits circumferentially spaced in a portion above said turn table;

a spindle shaft arranged to move up and down within said cylindrical spindle body;

a plurality of holder claws projecting through said axial slits for carrying record discs, said holder claws being rectractable into said cylindrical spindle body to drop one of the record discs onto said turn table when said spindle shaft moves downwardly;

a large gear rotatable mounted to said base plate;

means for selectively engaging said large gear with said turn table causing one complete revolution of said large gear;

a first cam groove for controlling the continuation of a record playing operation formed in said large gear;

a second cam groove for controlling the cessation of a record playing operation formed in said large gear;

a common inlet portion formed in said large gear for said first and second cam grooves;

a driving member pivotally mounted to said base plate, and having a hub arranged to be selectively guided along either one of said first and second cam grooves to shift a pickup arm when said large gear is rotated;

a switch member pivotally mounted to said large gear in said inlet portion for selectively opening either one of said first and second cam grooves and guiding said hub into either one of said first and second cam grooves;

a switch control member for switching said switch member once for one complete revolution of said large gear, said switch control member being movably mounted to said base plate for swinging movement in a plane substantially perpendicular to the movement of said spindle shaft, said switch control member engaging with said spindle shaft on its swinging movement when said spindle shaft has been moved down a predetermined distance by at least one record disc being carried on said holder claws to force said switch member to open said first groove for continuing a playing operation;

a cam surface formed in said large gear; and,

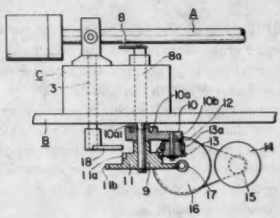
means for biasing said switch control member to cooperate with said cam surface so that said switch control member reciprocally swings upon one complete revolution of said large gear, said biasing means being connected between said base plate and said switch control member.

4,200,295

CONTROL MECHANISM FOR LIFTING, LOWERING AND SWINGING RECORD PLAYER TONEARM

Yuji Ikedo, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Mar. 14, 1978, Ser. No. 886,376
Claims priority, application Japan, Mar. 14, 1977, 52-26952
Int. Cl.² G11B 17/06
U.S. Cl. 274—15 R **7 Claims**



1. In a control mechanism for lifting, lowering and swinging the tonearm of a record player wherein the tonearm is adapted to rotate with a first shaft and to be lifted and lowered by an elevation plate mounted at the top of a second shaft, the improvement comprising:

(a) cam means rotatably mounted on a third shaft for lifting and lowering the second shaft in accordance with the rotation of the cam means;

(b) planetary gear means rotatably mounted on a fourth shaft;

(c) means mounting the fourth shaft eccentrically and directly on the cam means with respect to the third shaft whereby the planetary gear means may rotate about the fourth shaft and revolve about the third shaft, said mounting means comprising means for frictionally engaging said planetary gear means with said cam means, the force of frictional engagement being greater than that between said cam means and said second shaft;

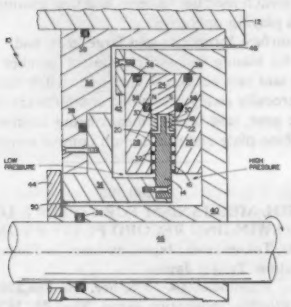
(d) driven plate means mounted on the first shaft for swinging the tonearm and positioned in a plane including the revolution locus of said planetary gear means; and

(e) means for driving said planetary gear means, whereby revolution of said planetary gear means about the third shaft rotates the cam means to lift and lower the tonearm until said planetary gear means is drivingly engaged with the driven plate means whereupon rotation of the planetary gear means about the fourth shaft rotates the tonearm.

4,200,296
FERROFLUID CENTRIFUGAL SEAL

Philip Stahl, Holliston, Mass.; Ronald Moskowitz, and Walter R. Reed, both of Merrimack, N.H., assignors to Ferrofluidics Corporation, Burlington, Mass.

Filed Nov. 29, 1978, Ser. No. 964,601
Int. Cl.[2] F16J 15/42, 15/16
U.S. Cl. 277—80 13 Claims



1. A centrifugal seal, the seal adapted to be secured to a rotatable shaft member for rotation therewith and to provide a seal between environments on opposite sides of the centrifugal seal, which seal comprises in combination:

(a) a vane assembly which includes a stationary, ferromagnetic vane characterized by a plurality of spaced, radially extending lip elements about the surface periphery thereof and a blade element extending from one end thereof;

(b) a magnetic-structure assembly which comprises

(i) a permanent magnet, and

(ii) a pair of ferromagnetic pole pieces extending, in a magnetic-flux relationship, from the permanent magnet to define a cavity between the pole pieces, the blade element extending into the cavity;

(c) the magnetic-structure assembly and the vane assembly in combination forming a seal assembly and defining a passageway from one surface of the seal into the cavity and another passageway from the other surface of the seal into the opposite side of the cavity;

(d) ferrofluid disposed within the cavity;

(e) the vane disposed in the cavity and defining with the pole pieces a gas-flow passageway extending about the external side and one end surface thereof, which, in the absence of the ferrofluid, provides gas-flow communication between the one and the other passageways; and

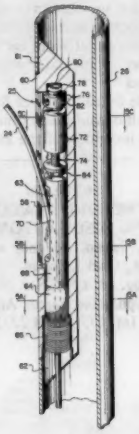
(f) the radial-lip elements extending into a close noncontacting relationship with the inner surface of each of the pole pieces, to define with the ferrofluid a magnetic-flux circuit between the permanent magnet, the pole pieces and the stationary vane,

whereby, in a static nonrotatable mode, the ferrofluid forms a plurality of stage seals between the lip elements and the pole pieces, and whereby, at a high-speed mode, the ferrofluid is forced by centrifugal force to one extending end of the cavity to form a seal barrier therein, thereby providing an improved centrifugal seal which provides for a sealing capacity with the same ferrofluid under static conditions or varying speed conditions.

4,200,297
SIDE ENTRY CLAMP AND PACKOFF

Alfred J. Tricon, Houston, Tex., assignor to Sperry-Sun, Inc., Sugar Land, Tex.

Filed Sep. 13, 1976, Ser. No. 722,540
Int. Cl.[2] F16J 15/16
U.S. Cl. 277—102 7 Claims



1. A side entry wireline packoff comprising:

a section of drillpipe;

a wall attached to the interior of the drillpipe forming an elongate housing partially filling the annulus of said drillpipe, said housing having a first opening through the side of said drillpipe adjacent a first end of said housing and a second opening into the interior of said drillpipe on a second end thereof, said housing further having a bulkhead on the first end thereof;

a compressible sealing element positioned in said housing over the second opening in said housing, said sealing element being adapted for receiving said wireline therethrough for the sealed engagement thereof by the longitudinal compression therearound within said housing; and

longitudinally expandible means positioned in said housing for engaging said bulkhead and said sealing element to compress said sealing element, thereby providing a seal between said wireline and said housing.

4,200,298
GAME BOARD AND GAME PIECES USEABLE THEREWITH

Stewart Lamlee, 55 W. 86th St., New York, N.Y. 10024

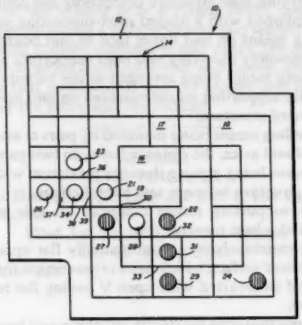
Filed Jun. 21, 1978, Ser. No. 917,545
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—236 3 Claims

1. A game apparatus for two or more players, the apparatus comprising:

a game board consisting of a pattern of equal value playing areas and a blank marginal portion therearound, the pattern having an outer perimeter consisting of eight right angle corners connected to one another, and the playing areas consisting of a single large square, a plurality of small squares, and a plurality of right angle figures, each playing area having at least three sides in common with at least three other contiguous playing areas,

six right angle figures comprising six of said right angle corners and the tangency of four of said six right angle

figures forming the remaining two of said right angle corners, and



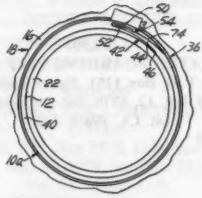
two sets of chips, the chips of one set being colored differently than the chips of the other set, wherein no more than one chip may occupy a single playing area at one time.

4,200,299

ADJUSTABLE SEAL MEMBER FOR CONDUIT TO MANHOLE JUNCTION

John Carlesimo, 29800 W. 8 Mile Rd., Farmington, Mich. 48024

Filed May 10, 1978, Ser. No. 904,426
Int. Cl.[2] F16J *15/00*; F16L *19/00*
U.S. Cl. 277—101 **5 Claims**



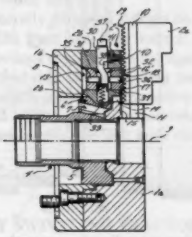
1. In a junction between a manhole well and a conduit having a generally cylindrical peripheral surface and an end disposed within an opening in a wall of said manhole well, a seal member comprising a substantially cylindrical tubular body of elastomeric material comprising a sleeve portion having a first end projecting outwardly from said opening in clamped sealed relationship to the peripheral surface of said conduit and an integral outwardly flared annular flange in sealing engagement with the edge of said opening, wherein the end of said sleeve in clamped sealed relationship to the peripheral surface of said conduit has an internal diameter adjustable within a range to conform to the outer diameter of said conduit and comprises an integral flap portion formed at said end provided with an edge extending from said end to a portion intermediate between said end and said flange, a pyramidal appendage forming a continuous edge for said end and having an apex tapering rearwardly toward the peripheral surface of said sleeve, said pyramidal appendage forming two substantially triangular angled panels joined at said apex and foldable one over the other over said flap, and clamp strap means for engaging said end in clamped sealed relationship to the peripheral surface of said conduit.

4,200,300

LATHE CHUCK WITH REMOVABLE JAWS

Günter H. Röhm, Heinrich-Röhm-Str. 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,348
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711904
Int. Cl.[2] B23B *31/14*
U.S. Cl. 279—1 C **15 Claims**



1. A chuck comprising:
a chuck body rotatable about an axis and formed with a plurality of angularly spaced radially extending inner guides and a plurality of angularly spaced radially extending outer guides;
a respective inner jaw part radially displaceable in said chuck body in each of said inner guides;
means including at least one operating element engageable with said inner jaw parts for radially displacing same in said chuck body in the respective inner guides;
a respective outer jaw part projecting axially from said chuck body and radially displaceable therein in each of said outer guides;
a respective coupling member between each of said inner jaw parts and the respective outer jaw part and displaceable between a coupling position engaging both of the respective parts and coupling same together for joint radial displacement and a decoupling position for relative radial displacement of same; and
means including a respective cam engaging each of said coupling members for displacing said members between said coupling and decoupling positions independently of one another, each of said cams being generally radially displaceable of said axis between a radial inner position corresponding to said decoupling position and a radial outer position corresponding to said coupling position, whereby centrifugal forces acting on said cams will urge said members into said coupling positions.

4,200,301

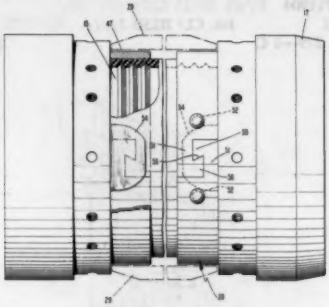
CORE LOCKING DEVICE

Ralph L. Ryan, East Hanover, N.J., assignor to JRC Products Inc., Boonton, N.J.

Filed Sep. 5, 1978, Ser. No. 939,265
Int. Cl.[2] B23B *31/40*
U.S. Cl. 279—2 A **2 Claims**

1. In an expandable device for locking a bored member to a shaft element, the expandable device having a body provided with an annular surface and an annular single wall expandable bladder covering said annular surface, means for sealing the ends of said bladder to said surface comprising in combination a plurality of parallel circumferential ridges at each end of said annular surface, the ends of said bladder overlying said ridges, and a pair of discontinuous circular bands formed with interlocking ends each positioned over one end of said bladder and dimensioned to force said bladder against said ridges when said ends are interlocked, each end of each band being formed with a flat laterally extending hook element, the hook elements on opposite ends of each band having the same shape but facing in

opposite directions to be complementary to each other and intermesh to provide a continuous band of uniform dimension throughout its circumference, each of said hook elements having a neck portion extending along one edge of the band



and a head portion extending transversely from that edge more than half way across the band, said head portion having a load carrying surface angled to prevent lateral movement of the interlocked hook elements when said bladder is expanded.

4,200,302

SAIL-PROPELLED LAND VEHICLE

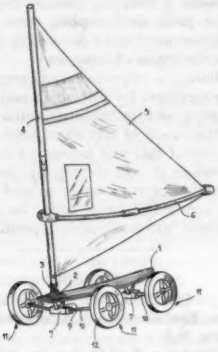
Arnaud L. G. de Rosnay, Paris, France, assignor to International Promotion Public Relation Establishment, Vaduz, Liechtenstein

Filed Jan. 27, 1978, Ser. No. 872,777

Claims priority, application France, Sep. 26, 1977, 77 28954; Dec. 12, 1977, 77 37405

Int. Cl.[2] B62B *3/00*

U.S. Cl. 280—1 **15 Claims**



1. A vehicle comprising:

a carrying board structure of a generally flat elongated configuration having an upper face and a lower face, and two lateral edges symmetrical with respect to a longitudinal symmetry plane;

two longitudinally spaced axle supporting means elastically hingedly mounted on said lower face of said board structure;

travelling means having low frictional contact surfaces for displacement of the vehicle on loose or firm surfaces;

a pair of axles, each having two opposite ends and adapted for being mounted within one of said axle supporting means so as to extend substantially perpendicularly to said longitudinal symmetry plane, and to have said opposite ends of each axle symmetrical with respect to said longitudinal symmetry plane and extending beyond said lateral edges of said board structure;

a sail-carrying mast structure comprising sail control means and equipped with a hinged mast-supporting means;

mounting means on said upper face of said board structure for removably receiving said mast supporting means, said mounting means being arranged at the vicinity of one of said axle supporting means mounted on said lower face of said board structure;

said travelling means being mounted by pairs at said opposite ends of said axles, the distance between two paired travelling means being greater than the maximum width of said board structure between said lateral edges;

said axle supporting means comprise an axle supporting body and a base member;

said base member having a substantially flat upper surface and a lower surface which has a cross-section the configuration of an inverted wide open V having flat inner wing surfaces;

means being provided for rigidly attaching said base member by said upper face thereof onto said lower face of said board structure;

said axle supporting body being formed with a transversal recess for receiving an axle and being connectable to said base member by a pivot member having one end mounted within said body and having its other end loosely received within a bore formed in said lower surface of said base member, and by a connecting screw screwed within a tapped bore formed within said lower surface of said base member;

said screw passing through at least one resilient damping member interposed between said body and said base member;

said screw and said pivot member each extending substantially perpendicular to the flat inner wing surfaces of said V-shaped lower surface of said base member;

means being provided for holding a tubular axle within said recess and for preventing same from displacement in a direction perpendicular to said longitudinals symmetry plane of said board structure.

4,200,303

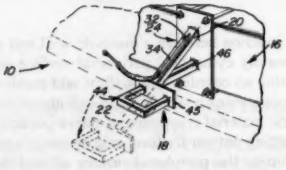
DOOR-OPERATED BOARDING STEP FOR TRUCKS

Patrick N. Kelly, P.O. Box 1251, Baker, Mont. 59313

Filed Jun. 12, 1978, Ser. No. 914,549

Int. Cl.[2] B60R *3/02*

U.S. Cl. 280—166 **7 Claims**



1. A door operated boarding step for vehicles, comprising, in combination:

(a) first and second step members, the second step member being slidingly supported from the first step member for extension and retraction thereto and including a foot engageable rest supported therefrom, the first step member being mountable on a vehicle beneath a door thereof; and

(b) operator means connected to the second step member and connectible to the door of the vehicle for extending the second step means from the first step means when the door is in an open mode, said operator means including a spring connected to the first step member and to the second step member for biasing the second step member

toward the first step member and retracting the second step member relative to the first step member when the door of the vehicle is in a closed mode, said first step member including a hollow sleeve, said second step member being slidably disposed in said sleeve, the spring being a tension spring disposed within said sleeve, and anchored to the first step member and the second step member for biasing the latter into the former.

4,200,304

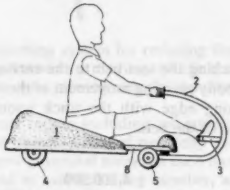
TWISTING CAR

Chuang-Li Hwang, No. 7, Lane 222 Sec. 1, Hsi-Tun Rd., Taichung, Taiwan

Filed Jul. 12, 1978, Ser. No. 923,800

Int. Cl.[2] B62M *29/00*

U.S. Cl. 280—218 **9 Claims**



1. A toy car which moves in a wavelike pattern due to a driver's twisting motion comprising in combination:

a frame which supports the car,

a pair of handles connected to a front portion of the frame through a pivot bolt,

a wheeled first axle interconnecting a terminal rearward portion of said frame,

and a wheeled second axle interconnecting said pair of handles at an area between said pivot bolt and said wheeled first axle whereby rotation of said handles rotates said wheeled second axle about said pivot bolt and thus the car moves in a serpentine manner.

4,200,305

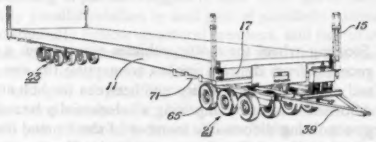
TRAILER ASSEMBLY FOR CARRYING OVERWIDTH LOADS

Marcus P. Eubank, P.O. Box 7576, Longview, Tex. 75602

Filed Aug. 11, 1978, Ser. No. 932,914

Int. Cl.[2] B60P *3/40*

U.S. Cl. 280—404 **10 Claims**



1. A trailer assembly for carrying loads, even overwidth loads, comprising in combination:

a. a front unit having a lower frame mounted on a plurality of wheels;

b. an upper frame rotatably mounted to the lower frame so as to allow the wheels and lower frame to be turned sufficiently to allow said front unit to be moved laterally for movement into a close space and at least 90° in either direction from straight ahead with respect to the upper frame;

c. a tongue connected to the lower frame and having hitch means for connection to a towing vehicle;

d. a rear unit having a frame mounted on a plurality of wheels, the rear unit being capable of being moved independently of the front unit;

e. a plurality of cross members mounted to the upper frame of the front unit and the frame of the rear unit;

f. conversion means for selectively shifting the cross members between a load position, wherein the ends of the cross members protrude beyond the edges of the wheels for supporting overwidth loads, and a storage position, wherein the ends do not extend past the outer edges of the wheels for trips while empty;

g. front and rear laterally disposed flanges on the respective upper frame of the front and rear units at the respective front and rear portions thereof to move against overwidth loads; said front and rear flanges having means for fastening to said overwidth loads, the respective front and rear being determined by the particular assembly; and

h. tow means for towing the rear unit with the first trailer on empty trips.

4,200,306

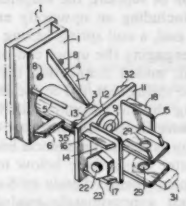
UNIVERSALLY SWIVELING TRACTOR HITCH

Bland E. Helms, Rte. #3, Box 451 A, Fort Pierce, Fla. 33451, assignor to Bland E. Helms

Filed Jun. 15, 1978, Ser. No. 915,804

Int. Cl.[2] B60D *1/00*

U.S. Cl. 280—494 **2 Claims**



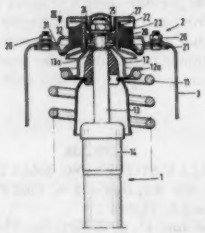
1. A hitch for connecting a tractor to an agricultural implement to be drawn thereby, comprising, a normally-vertical channel section for rigid attachment to the implement, a first tube section having its rearward end fitting a hole in and through said channel section and rigidly and integrally fixed to and with said section, and extending forwardly and horizontally therefrom, to define a normally-horizontal fore-and-aft first pivot axis, a second tube section fitting and rotatably journaled within said first tube section for rotation about said first axis, a first collar fixed with and fitting about the rearwardly-projecting end of said second tube section, a generally flat plate having an aperture fitting about and receiving with a smooth fit, the forward end of said second tube section and integrally attached to said second tube section, normal thereto, second and third collars fixed with the forward end of said second tube section, upon opposite sides of said plate, respectively, and integrally fixed with said plate and second tube section, said second collar abutting the forward end of said first tube section for preventing relative translation between said first and second tube sections along said first axis, first and second trunnions fixed with said plate to extend forwardly thereof and symmetrically disposed on opposite sides of said first axis, said trunnions having respective ones of a first pair of transversely aligned bearings defining a second pivot axis normal to and intersecting said first axis, a clevis fitting between said trunnions and including vertically-spaced parallel forwardly-extending arms, a third tube section integrally fixed with and within the bight portion of said clevis, a pivot bolt having its ends journaled in said first pair of aligned bearings and having a smooth bearing in and through said third tube section, to pivot said clevis about said second axis, there being a pair of vertically aligned holes in and through the respective distal ends of said arms and defing a third pivot axis normal to said first and second axes and intersecting said second axis.

4,200,307

MOUNT FOR SUPPORTING A SUSPENSION STRUT ASSEMBLY ON A VEHICLE BODY

László Szabó, Lehre, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Sep. 26, 1978, Ser. No. 946,444
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745380
Int. Cl.[2] B60G *11/52*
U.S. Cl. 280—668 7 Claims



1. In a mount for attaching a suspension means to a vehicle body at a location of support; the suspension means having a shock absorber including an upwardly extending piston rod having an upper end, a coil spring having an upper end and a spring seat disc engaging the upper end of the coil spring; an antivibration unit; means connecting the upper end of the piston rod and the spring seat disc to the antivibration unit; the mount connecting the antivibration unit to the vehicle body and having an outer flange forming part of the antivibration unit; an aperture provided in the vehicle body; securing screws tightening the outer flange from below to a rim zone of the aperture; the improvement wherein said outer flange has an elongated, at least approximately oval-shaped outline and wherein the outline of said aperture is of substantially lesser dimension than the length dimension of the elongated outer flange, and further wherein said aperture has, at least in one direction, a diametral dimension that is slightly greater than the width dimension of said elongated outer flange and further wherein the diameter of said spring seat disc is sufficiently small to permit upward removal of said antivibration unit and said spring seat disc after loosening said securing screws and upon tilting said antivibration unit about a transverse axis thereof.

4,200,308

LINEAR LOCKING SEAT BELT RETRACTOR

Clarence C. Irwin, Sterling Heights, and David F. Manz, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1978, Ser. No. 936,797
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—804 2 Claims

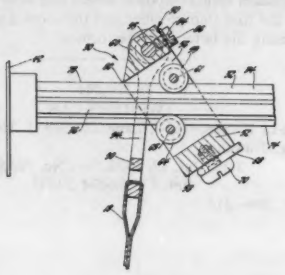
1. A seat belt locking and retracting mechanism comprising:

a longitudinally extending track having oppositely facing knife edge and reaction face portions and a guide track portion;

a belt carriage having roller means engaging the guide track portion to mount the carriage on the track for longitudinal movement therealong and being bodily pivotable relative the track, said carriage having a knife locking edge and a leg respectively engageable with the track knife edge and the track reaction face upon bodily pivoting movement of the carriage to lock the carriage against movement along the track in the belt extending direction; and

a return spring acting on the belt carriage to urge the belt carriage in a belt retracting direction;

a spring means associated with the carriage and slidably bearing upon the track to urge the carriage to a normal position wherein the carriage knife locking edge and leg are spaced from engagement with the track knife edge and reaction face to permit movement of the carriage along the track; and



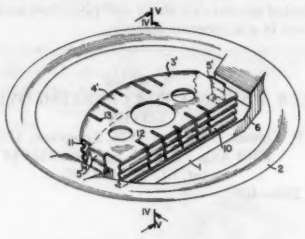
means attaching the seat belt to the carriage in a manner to effect bodily pivoting movement of the carriage to engage the locking edge with the track upon attempted rapid extension of the belt.

4,200,309

SAFETY STEERING WHEEL FOR MOTOR VEHICLES

Hans Korn, Hanau; Klaus Grothe, Aschaffenburg, and Wolfgang Bauer, Mainaschaff, all of Fed. Rep. of Germany, assignors to Karl Schmidt GmbH, Neckarsulm, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 733,541, Oct. 18, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,710
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549285
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—750 5 Claims



1. Steering wheel for motor vehicles comprising: a rim, a hub recessed from the rim, spokes connecting the rim to the hub and deformable means disposed between the hub and rim, said deformable means comprising a substantially box-shaped, energy-absorbing deformable member of sheet metal disposed between the hub and rim of the steering wheel having two base portions connected to the spokes and stationary with respect to the rim, spokes and hub, deformable sides and a substantially nondeforming top portion movable relative to the rim, spokes and hub in response to the deformation of the sides each side being provided with a plurality of spaced longitudinal slots extending partially into the top portion and then downwardly along said side thereby subdividing each side into a plurality of independently deformable elements, the axial height of said member and the extent to which it can be deformed corresponding approximately to the distance between the plane of the rim of the steering wheel and that edge of the hub of the steering wheel which is disposed on the steering wheel side of said hub, whereby upon impact by a vehicle operator the

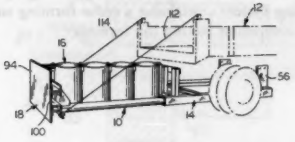
deformable member deforms to cushion the blow of the operator.

4,200,310

ENERGY ABSORBING SYSTEM

John F. Carney, III, Mansfield, Conn., assignor to State of Connecticut, Hartford, Conn.

Filed Jul. 20, 1978, Ser. No. 926,419
Int. Cl.[2] B62D *21/02*
U.S. Cl. 280—784 **8 Claims**



1. An energy absorbing system for reducing the severity of vehicular collisions between a moving vehicle and an immovable object, or between a moving vehicle and another moving object comprising:

a. guidance frame means including an attaching member secured to the object, a pair of parallelly extending substantially hollow structural members each having one end thereof secured to said attaching member, and first support means securing the other end of each of said pair of parallelly extending substantially hollow structural members to the object;

b. energy absorbing means including a multiplicity of cylindrical members aligned so as to form a row thereof extending substantially parallel to said pair of parallelly extending substantially hollow structural members, one of said multiplicity of cylindrical members being interconnected to said attaching member, said multiplicity of cylindrical members each having an uncollapsed state and a collapsed state, said multiplicity of cylindrical members being interconnected in series relation one to another so as to change from the uncollapsed state to the collapsed state thereof in accord with a predetermined pattern when the object is struck by an errant moving vehicle with said multiplicity of cylindrical members thereby functioning to absorb the energy released during the vehicular collision between the errant moving vehicle and the object; and

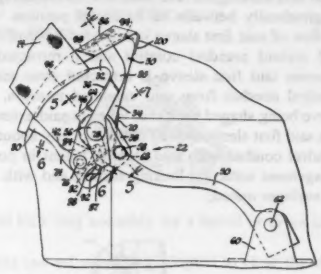
c. impacting plate means including a vertically extending surface designed to be the surface struck by the errant moving vehicle, said vertically extending surface being interconnected to another one of said multiplicity of cylindrical members, and a pair of movable structural members extending in parallel relation to each other and in substantially parallel relation to said pair of parallelly extending substantially hollow structural members, said pair of movable structural members each having the other end thereof received in supported relation within a corresponding one of said pair of parallelly extending substantially hollow structural members for sliding movement relative thereto, said pair of movable structural members being movable between a first position corresponding to the uncollapsed state of said multiplicity of cylindrical members wherein said other end of each of said pair of movable structural members is spaced a predetermined distance away from said other end of each of said pair of parallelly extending substantially hollow structural members and a second position corresponding to the collapsed state of said multiplicity of cylindrical members wherein said other end of each of said pair of movable structural members occupies a position adjacent to said other end of each of said pair of parallelly extending substantially hollow structural members, said pair of movable structural members being caused to move from said first position thereof to said second position thereof as a consequence of said multiplicity of cylindrical members changing from the uncollapsed state to the collapsed state thereof upon the occurrence of a vehicular collision between an errant moving vehicle and the object.

4,200,311

SEAT BELT SECURING DEVICE

Kenneth H. Reid, Mt. Clemens, and Walter T. Ozias, Jr., Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 2, 1979, Ser. No. 8,542
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—801 **3 Claims**



1. In a vehicle body seat belt system having one end anchored at one side of the seated occupant and a loop of belt adapted for securement at the other side of the seated occupant, a securing device for releasably capturing the loop to position the belt in the occupant restraining position and comprising:

mounting means on the vehicle body generally adjacent the hip of the seated occupant;

a C-shaped hook member including a belt engaging leg and a mounting leg defining a belt receiving slot having a forwardly facing open end;

pivot means acting between the mounting means and the mounting leg to mount the hook member for pivotal movement between a normal position wherein the belt engaging leg and the slot extend in a downwardly belt capturing direction and a rearwardly pivoted position wherein the belt engaging leg and the slot extend in an upwardly belt releasing direction;

a locking member movably mounted on the mounting means and normally engageable with the mounting leg to block rearward pivoting movement of the hook member;

and a release lever pivotally mounted by the pivot means and having a cam surface engageable with the locking member for disengaging the locking member from the mounting leg to permit rearward pivoting movement of the hook member, said release lever having a push button mounted in an occupant accessible position adjacent the belt engaging leg of the hook member for effecting pivotal movement of the release lever relative the hook member upon occupant depression of the push button.

4,200,312

SUBSEA FLOWLINE CONNECTOR

Bruce J. Watkins, Palos Verdes Estates, Calif., assignor to Regan Offshore International, Inc., San Pedro, Calif.

Filed Feb. 6, 1978, Ser. No. 875,639
Int. Cl.[2] F16L *37/08*
U.S. Cl. 285—18 **6 Claims**

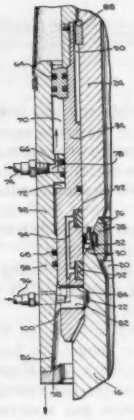
1. A remotely actuatable connector for releasably connecting a pair of pipes comprising:

(a) a first mandrel conduit adapted on one end for connec-

tion to one of the pipes and having a seating surface and an external locking surface on the other end;

(b) a second mandrel conduit adapted on one end for connection to the other of the pipes and having a seating surface on the other end adapted to sealably mate with said seating surface of said first mandrel conduit when said first and second mandrel conduits are disposed in end-to-end relationship along a common longitudinal axis;

(c) a first sleeve disposed concentrically about said second mandrel and including movable locking means adapted for movement between a locked position engaged with said locking surface and an unlocked position disengaged from said locking surface, said first sleeve being movable longitudinally between an extended position wherein a portion of said first sleeve is extended beyond the end of said second mandrel conduit and a retracted position wherein said first sleeve is retracted over said second mandrel conduit from said extended position, said first sleeve being shaped such that when in said extended position said first sleeve will fit concentrically about said first mandrel conduit with said locking means in position for engagement with said locking surface and with said seating surfaces mated;



(d) means adapted for connection to a remote supply of selectable actuating power for moving said first sleeve between said extended and retracted positions;

(e) a second sleeve disposed concentrically about said first sleeve and having an actuating surface for engaging said locking means of said first sleeve, said second sleeve being movable between a first position where said locking means is moved to and held in its locked position and a second position where said locking means is free to move from its locked position to its unlocked position; and,

(f) means adapted for connection to a remote supply of actuating power for moving said second sleeve between said first and second positions; and wherein,

(g) said first sleeve and said second mandrel conduit have cooperating stop means for preventing said first sleeve from extending over the end of said second mandrel conduit beyond said extended position; and,

(h) said locking means and said locking surface engage in cammed relationship whereby as said actuating surface of said second sleeve moves said locking means into said locked position said mated seating surfaces are drawn tightly together by compressive force on said stop means and said locking surface.

4,200,313

CARBONLESS DUPLICATING SYSTEMS

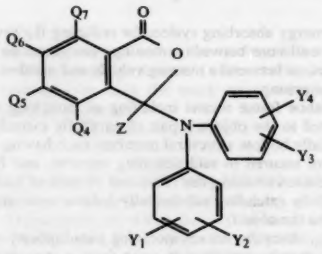
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 942,996, Sep. 18, 1978, which is a continuation-in-part of Ser. No. 821,927, Aug. 4, 1977, Pat. No. 4,168,378, which is a continuation-in-part of Ser. No. 755,183, Dec. 29, 1976, abandoned. This application Mar. 12, 1979, Ser. No. 19,594

Int. Cl.[2] B41M *5/16, 5/18, 5/22*

U.S. Cl. 282—27.5 **15 Claims**

1. A pressure-sensitive carbonless duplicating system or thermal marking system containing a color-forming substance comprising a compound having the formula



wherein:

Q_4 is hydrogen or halo;

Q_5 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_6 and Q_7 are each hydrogen;

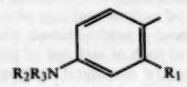
Q_6 is the same as Q_4; or di-lower-alkylamino, halo or COX when Q_4, Q_5 and Q_7 are each hydrogen;

Q_7 is the same as Q_4;

X is hydroxy, benzyloxy, alkoxy having from 1 to 18 carbon atoms or OM where M is an alkali metal cation, an ammonium cation or a mono-, di- or trialkylammonium cation having from 1 to 18 carbon atoms;

Y_1, Y_2, Y_3 and Y_4 are the same or different and are selected from the group consisting of hydrogen, halo, hydroxyl, lower-alkoxy, alkyl having from 1 to 9 carbon atoms, phenyl-lower-alkyl, $COOR_4$ and NR_5R_6 where R_4 and R_5 are hydrogen or lower-alkyl and R_6 is hydrogen, lower-alkyl, cycloalkyl having from 5 to 7 carbon atoms, lower alkanoyl, phenylsulfonyl or lower-alkyl-substituted phenylsulfonyl;

Z is a radical having the formula



in which:

R_1 is selected from the group consisting of hydrogen, halo, lower-alkyl, lower-alkoxy and di-lower-alkylamino;

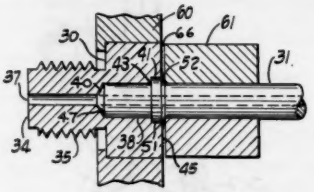
R_2 is lower-alkyl; and

R_3 is selected from the group consisting of lower-alkyl, benzyl, phenyl, and phenyl substituted with a lower-alkyl or lower-alkoxy group.

4,200,314
TUBE FITTING ASSEMBLY

Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903

Division of Ser. No. 425,561, Dec. 17, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,683
Int. Cl.[2] F16L *13/14*
U.S. Cl. 285—382.5 14 Claims

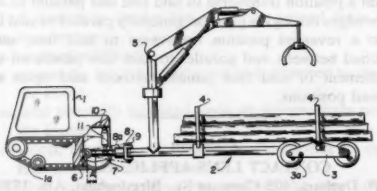


1. A tube fitting assembly comprising in combination:
a fitting having a first wall defining a first orifice through at least a portion of said fitting,
said fitting having a second wall defining a second orifice through a portion of said first orifice and being larger in cross section than said first orifice and said larger cross section extending to an outside surface of said fitting,
a tubing having an internal passage and having a first portion engaging said first wall and occupying substantially all of said first orifice and having a first longitudinally compressed and radially expanded tubing portion engaging said second wall and occupying substantially all of said second orifice radially outwardly from said internal passage of said tubing,
said radially expanded tubing portion being worked to flow radially into engagement with substantially all of said second wall whereby the tubing wall thickness is increased yet retains a substantially constant inner wall diameter,
retention means longitudinally retaining said tubing within said fitting and including said radially expanded tubing portion engaging said fitting,
and said tubing having a deformed portion of said tubing engaging said outside surface of said fitting about said second orifice.

4,200,315
DRAWBAR FOR A TRAILER

Kaj Carlsson, Singsby, Finland, assignor to Konetehdas Maskinfabrik Norcar Ky Kb, Finland

Filed Oct. 18, 1978, Ser. No. 952,461
Claims priority, application Finland, Oct. 21, 1977, 773132
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—492 6 Claims

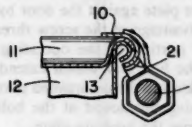


1. A device for connecting a pulling vehicle and a trailer having a lifting device mounted on the trailer and being operative to engage a load and laterally load the trailer, comprising a rigid member having one end pivotally connected to said trailer for movement about a vertical axis in a substantially horizontal plane and another end pivotally connected to said pulling vehicle for movement about a horizontal axis in a substantially vertical plane, a fluid pressure telescopic member connected to said pulling vehicle having a portion operatively connected to said rigid member, said piston being operative to rigidly lock said rigid member in selective positions to said vehicle thereby forming a rigid connection in a vertical plane between said pulling vehicle and said trailer.

4,200,316
BARREL RING LOCK ASSEMBLY

Edward S. Kennedy, Strongsville, Ohio, assignor to Group Industries Incorporated, Cleveland, Ohio

Filed Jun. 12, 1978, Ser. No. 914,210
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—256.67 7 Claims

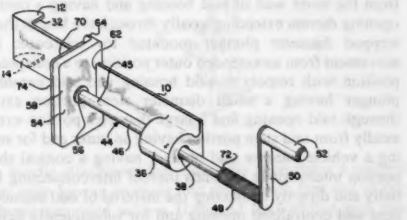


1. A steel lock ring assembly for a barrel or drum comprising:
a split and curved metal ring adapted to close the chime of the barrel or drum and its cover;
metal fittings on the ends of said ring for tightening up the ring, each fitting to include a machine nut with each nut having a sheet metal encapsulation on its exterior surface;
an arcuate-shaped member attached to the marginal edge of the sheet metal encapsulation adapted to closely conform with the curved metal ring and extend over the chime of the barrel or drum;
a tang extending to the side of the fitting in a direction away from the end of the split ring and positioned to be on the underside of the chime of the barrel or drum;
said sheet metal encapsulation member and tang being securely fastened to the ends of the ring and to the nuts, with one of said nuts being threaded and the other plain; and
a threaded bolt closure means for securing the ends of the ring and fittings together.

4,200,317
DOOR FASTENER

Luigi Polselli, and Rudolph Polselli, both of 8 Groce Ave., Glenolden, Pa. 19036

Filed Jun. 15, 1978, Ser. No. 915,781
Int. Cl.[2] E05C *19/00*
U.S. Cl. 292—293 3 Claims



1. In a portable door fastener of the type suitable to partially insert into the latch space of the door lock to lock a horizontally swinging door in closed position against its associated jamb, the combination of
a slide body comprising a length of thin, strong material, said body including at least one forward gripper projection adapted to insert into the latch space;

a socket rearwardly affixed to the body in spaced relationship to the gripper,

said socket including an integral, threaded section;

a pressure plate adapted to slide relative to the body,

said pressure plate comprising a door contacting surface; and

an operating bolt longitudinally movable through the socket,

said operating bolt being adapted to forwardly carry the pressure plate in a rotative connection,

said operating bolt comprising threaded and unthreaded portions, the unthreaded portion being adapted to move rapidly through the socket to either push the pressure plate toward the door or to pull the pressure plate away from the door,

the threaded portion of the operating bolt being adapted to engage in the threaded section of the socket to urge the pressure plate against the door by utilizing the mechanical advantage of the screw threads,

the threaded portion of the operating bolt being positioned at the bolt end which extends away from the pressure plate and the unthreaded portion of the operating bolt being positioned at the bolt end which forwardly carries the pressure plate,

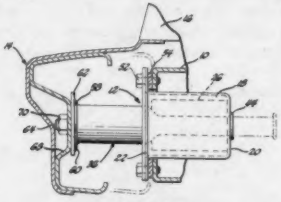
whereby the door fastener may be rapidly applied to and removed from a door for locking and unlocking purposes.

4,200,318

BUMPER SUPPORTING ENERGY ABSORBER FOR VEHICLES

Loren R. Gute, Dayton, and Wayne V. Fannin, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 30, 1978, Ser. No. 937,934
Int. Cl.[2] B60R *19/08*
U.S. Cl. 293—136 **2 Claims**



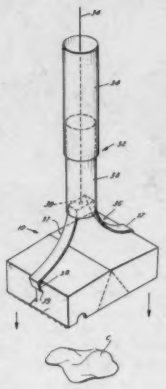
1. An energy-absorbing unit for mounting a bumper assembly to a support on an automobile comprising a housing having a chamber therein, an energy absorbing capsule of resilient material operatively mounted in said chamber, said energy-absorbing capsule having a peripheral wall spaced inwardly from the inner wall of said housing and having a centralized opening therein extending axially through the length thereof, a stepped diameter plunger mounted for telescopic inward movement from an extended outer position to a collapsed inner position with respect to said housing and said capsule, said plunger having a small diameter stem portion extending through said opening and a large diameter portion extending axially from said stem portion having an outer end for supporting a vehicle bumper said plunger having a conical shoulder portion intermediate the ends thereof interconnecting for initially and directly contacting the material of said capsule adjacent said centralized opening and for subsequently deflecting said resilient capsule radially outwardly in response to an impact load moving said shoulder portion into said capsule as said plunger moves from said extended outer position to said collapsed inner position, and said conical shoulder portion further providing a return surface on which the resilient material of said capsule directly acts to move said plunger from said collapsed position to said extended position in response to removal of said impact load.

4,200,319

SNAP-CLOSING CONTAINER

Herbert Cooper, 1 Toms Point La., Port Washington, N.Y. 11050

Filed Apr. 14, 1978, Ser. No. 896,307
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—1 BA **10 Claims**



1. A container comprising:

a pair of generally similarly dimensioned face panels each having an inner edge joined to and forming a hinge line with the inner edge of the other panel, an outer edge generally parallel to and spaced from said line, and a pair of generally parallel side edges each extending between the respective inner and outer edges;

a pair of normally generally parallel side panels extending transversely from each of said face panels, each from a respective side edge of the respective face panel;

an end panel extending transversely from each of said outer edges in the same direction as said side panels and generally fixed relative to the side panels of the respective face panel, said face panels being relatively foldable at said line without folding any of the other panels between a stable open position with said face panels generally co-planar and said end panels spaced from each other and a stable closed position with said face panels at an acute angle to each other, said end panels generally meeting, and said side panels overlapping and generally parallel to one another; and

a web at each end of said hinge line and having a pair of nonparallel edges joined to the respective side panels, said webs and panels being stiff and uncreased but limitedly deformable and said webs moving with limited nonpermanent deformation of themselves and of said side panels from a position transverse to said line and parallel to said side edges through a position generally parallel to said line into a reversed position transverse to said line, sandwiched between and parallel to said side panels on displacement of said face panels between said open and closed positions.

4,200,320

CONTACT LENS APPLICATOR

Henry B. Durham, 405 Chestnut St., Birmingham, Ala. 35206

Filed Jun. 12, 1978, Ser. No. 914,591
Int. Cl.[2] A61F *9/00*
U.S. Cl. 294—1 CA **5 Claims**

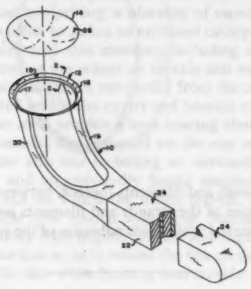
1. A contact lens applicator comprising:

a circular ring having a region on one side which is bevelled to generally conform to a convex surface of a contact lens;

an elongated handle; and

support means comprising a pair of spaced flexible and

bendable coupling members, said coupling members extending from diametrically opposed regions of said ring to said handle, first in a direction generally normal to the plane of said ring leaving an open region of view through, and normal to, said ring and unobstructed by said coupling members, and then said coupling members extending in a



direction having a directional component along a line parallel with the plane of said ring;

whereby, when used, one may sight through a lens supported by said ring into a mirror, enabling an accurate and close positioning of the lens in front of the eye, and upon contact with the eye, said coupling is readily bendable, and thus there is no positive force applied to the eye.

4,200,321

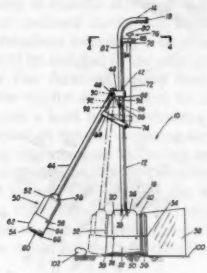
SANITATION DEVICE

Ralph Warkentin, Rte. 2, Box 2012, Burleson, Tex. 76028

Filed Mar. 13, 1978, Ser. No. 885,479

Int. Cl.[2] A01K *29/00*

U.S. Cl. 294—1 BA **12 Claims**



1. A sanitation device for collecting animal feces and the like, comprising:

a longitudinal frame;

a receptacle, having a first open end, attached to one end of the frame;

an arm pivotally mounted upon an intermediate portion of the frame;

a scoop, mounted upon the arm and having an open end facing the receptacle; and

trigger actuating means for pivoting the arm toward the frame such that the scoop moves in a scooping action for sliding under animal feces and carrying it toward the receptacle and moving the open end of the scoop into engagement with the first open end of the receptacle, the trigger actuating means extending from the frame to a portion of said arm between the pivotally mounted part of said arm and said scoop.

4,200,322

RETRIEVING DEVICE

Raymond A. Smith, Rte. 8, Box 191, Lexington, N.C. 27292

Filed Oct. 20, 1978, Ser. No. 953,002

Int. Cl.[2] B25J *1/00*

U.S. Cl. 294—19 R **3 Claims**

1. A walking aid for retrieving objects comprising: a handle, said handle being joined to an elongated shaft, said shaft having a support ring and a frictional engaging means, a pull rod, said pull rod being joined to linkage means, said linkage means being connected to an arm member, said arm member being pivotable from an open to a closed position, said arm member including aresilient lip, said lip overlappingly contacting said frictional engaging means when the arm member is in the closed position.

4,200,323

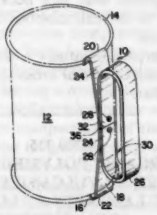
HANDLE ATTACHMENT FOR CONTAINERS

John A. Cocksedge, 7488 Mountain Rd., Niagara Falls, Ontario, Canada

Continuation-in-part of Ser. No. 738,331, Nov. 2, 1976, abandoned. This application May 1, 1978, Ser. No. 901,478

Int. Cl.[2] A47J *45/00*

U.S. Cl. 294—33 **8 Claims**



1. A handle attachment for containers comprising a unitary resilient strap having an elongated shape, each free end of the strap being provided with a U-shaped hooked-like end, the portion of the strap defining said free end having concave and convex opposed parallel lateral surfaces, the concave surface being disposed co-extensive with the interior surfaces formed by the U-shaped hooked-like ends, a handle element, said handle element having a substantially oblong opening therein, a portion of the exterior surface of the handle element being disposed fixedly secured to the strap on a portion of the exte-

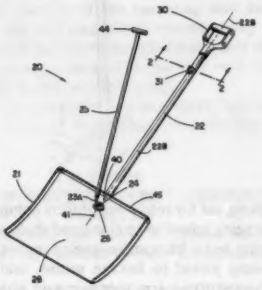
rior surface thereof being contiguous with said convex surface, said resilient strap having a pair of portions disposed intermediate said hooked ends and said portion of said exterior surface, said pair of portions extending at acute angles to said portion of said exterior surface and outwardly away therefrom, whereby the distance separating said hooked-like ends is greater when the longitudinal axes of said pair of portions is maintained manipulated into co-axial alignment with the longitudinal axis of said portion of said exterior surface than when said pair of portions is free from said manipulation.

4,200,324

SHOVEL WITH IMPROVED LIFTING MEANS

Wayland Helton, 1351 Nordyke Ave., Indianapolis, Ind. 46221

Filed Jun. 16, 1978, Ser. No. 916,140
Int. Cl.[2] A01B *1/22*; B25G *3/38*
U.S. Cl. 294—58 **3 Claims**



1. In combination:

a shovel having a blade portion and a handle secured to said blade portion;

auxiliary lifting means connected to said blade portion and cooperatively arranged with said handle for lifting said blade portion, said blade portion including an outer surface and an oppositely disposed rear surface, said handle being secured to said rear surface;

means for attaching said auxiliary lifting means to said outer surface, said attaching means including a ball member and a socket member arranged into a ball and socket connection;

said auxiliary lifting means including a rigid bar having gripping means at one end and a neck member extending from the opposite end, said neck member joining said opposite end to the ball member of said ball and socket connection; and

said neck portion is substantially L-shaped into two portions and is of a reduced lateral cross-sectional area compared to said rigid bar.

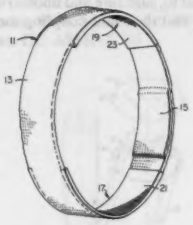
4,200,325

SYNTHETIC ORGANIC POLYMERIC PLASTIC SLING PROTECTED BY VULCANIZED OR CURED ELASTOMERIC LAMINATE AT LOAD CONTACTING AREA THEREOF

Charles E. Johnson, Kenmore, N.Y., assignor to Buffalo Weaving and Belting Co., Buffalo, N.Y.

Continuation-in-part of Ser. No. 628,958, Nov. 5, 1975, Pat. No. 4,052,095. This application Sep. 23, 1977, Ser. No. 835,866
The portion of the term of this patent subsequent to Oct. 4, 1994, has been disclaimed.
Int. Cl.[2] B66C *1/12*
U.S. Cl. 294—74 **27 Claims**

1. A sling which comprises a web of woven synthetic organic polymeric strands of filaments of material selected from the group consisting of nylon, aramid and polyester, with a lamina of a synthetic elastomeric polyurethane vulcanized or cured onto a load contacting surface thereof and filling surface openings between the polymeric strands, and with a thin coat-



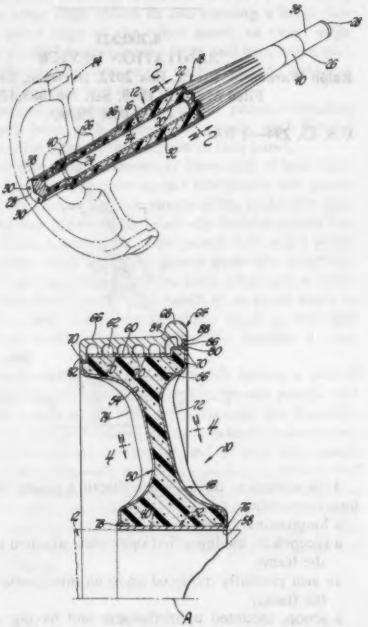
ing on the strands and filaments thereof, between the synthetic organic polymer of the strands and filaments and the polyurethane, of a material which aids adhesion of the polyurethane to the strands.

4,200,326

REINFORCED RAILWAY WHEELS AND AXLES

Raymond J. Wilcox, Santa Monica, Calif., assignor to Republic Corporation, Century City, Calif.

Filed Dec. 19, 1977, Ser. No. 861,486
Int. Cl.[2] B60B *3/12, 17/00, 35/12, 37/06*
U.S. Cl. 295—23 **13 Claims**



1. A vehicle axle comprising: an elongated hollow inner axle member made from a metallic material and having opposite ends as well as an intermediate portion extending therebetween; an elongated hollow outer axle member made from a metallic material and having opposite ends as well as an intermediate portion extending therebetween; said intermediate portion of the outer axle member including longitudinal ribs of a generally uniform wall thickness spaced circumferentially

from each other; each rib including circumferentially spaced inner ends and an outwardly extending intermediate rib portion; said inner axle member being received within said outer axle member in a spaced relationship thereto with the ends of the axle members located adjacent each other in associated pairs; and foam located between the inner and outer axle members and bonded to each axle member so as to provide a load bearing element therebetween.

5. A rail wheel comprising: a plurality of metallic members secured to each other to define an enclosed cavity and an outer skin of the wheel; said skin members including a central hub surface for mounting the wheel on an axle and an annular rim mounting surface that faces outwardly from the central wheel axis; foam located within the cavity and bonded to the metallic skin members so as to provide a load bearing element therebetween; and a metallic tire mounted on the rim mounting surface of the outer skin and including an outwardly extending annular flange and an outwardly facing annular surface for rolling over a rail on which the wheel travels, said tire also including annular ribs spaced along the central wheel axis extending inwardly with respect thereto and engaged with the rim mounting surface so as to mount the tire on the rim mounting surface of the skin while limiting heat transfer thereto from the tire.

11. An axle and wheel assembly for use on railcars, the assembly comprising: an axle including an elongated hollow inner axle member made from a metallic material and having opposite ends as well as an intermediate portion extending therebetween, an elongated hollow outer axle member made from a metallic material and having opposite ends as well as an intermediate portion extending therebetween, said intermediate portion of the outer axle member including longitudinal ribs of a generally uniform wall thickness spaced circumferentially from each other, each rib including circumferentially spaced inner ends and an outwardly extending intermediate rib portion, said inner axle member being received within said outer axle member in a spaced relationship thereto with the ends of the axle members located adjacent each other in associated pairs to provide axle ends, foam located between the inner and outer axle members and bonded to each axle member so as to provide a load bearing element therebetween; and a wheel including a plurality of metallic skin members secured to each other to define an enclosed cavity and an outer skin of the wheel, said skin members including a central hub surface for mounting the wheel on one end of the axle and an annular rim mounting surface that faces outwardly from the axle, foam located within the cavity and bonded to the metallic skin members to provide a load bearing element therebetween, a metallic tire mounted on the rim mounting surface of the outer skin and including an outwardly extending annular flange and an outwardly facing annular surface for rolling on a rail over which the wheel travels, and said tire also including annular ribs spaced along the central wheel axis extending inwardly with repect thereto so as to mount the tire on the rim mounting surface of the skin while limiting heat transfer thereto from the tire.

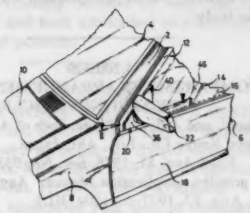
4,200,327

AIR-DEFLECTING ARRANGEMENT

Manfred Wepler, Bischofsheim, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1978, Ser. No. 931,091
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—15 **7 Claims**

1. An air-deflecting arrangement in a motor vehicle for maintaining a predetermined portion of a side window of said motor vehicle substantially clear and unobscured from airborne road dust, said motor vehicle having a bodywork portion located adjacent a forward edge of said side window and a rear-view mirror mounted on said vehicle so as to be readily visible to an occupant of the vehicle through said predetermined portion of said side window, said air-deflecting arrangement comprising an air-deflecting edge member extending substantially vertically along said bodywork portion and adjacent said forward edge of said window without forming any air space between said bodywork portion and said air-deflecting edge member, said air-deflecting edge member being formed with a smoothly curved lip portion extending away from said



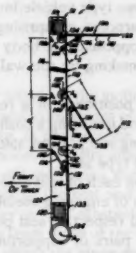
side window such that, when the vehicle is in forward motion, the air stream passing said side window is deflected away from said predetermined portion and thus substantially prevented from depositing thereon any road dust and water entrained in said air stream.

4,200,328

TAILGATE CONSTRUCTION

Homer R. Morgan, 2765 Townley Cir., Doraville, Ga. 30340

Division of Ser. No. 843,804, Oct. 20, 1977, Pat. No. 4,136,905.
This application Nov. 17, 1978, Ser. No. 961,694
Int. Cl.[2] B62D *25/00*
U.S. Cl. 296—50 **4 Claims**



1. A reduced air drag tailgate construction pivotally mounted in the tailgate opening between the truck sidewalls at the trailing end of the open top cargo compartment of a pickup truck on the tailgate mounting brackets provided on the pickup truck, said tailgate construction comprising:

a conventional tailgate body including a pair of end plates and an outer skin which extends between said end plates, said tailgate body having a peripheral configuration complementary to the configuration of the tailgate opening to the open top cargo compartment of the pickup truck to selectively close the tailgate opening when said tailgate body is pivoted upwardly to a closed position, said tailgate body defining an air opening therethrough through said outer skin through which the air can freely flow when the vehicle is in motion;

a screen member mounted on said tailgate body over said air opening and defining a plurality of small air passages therethrough where the size of any one of said air passages is sufficiently small to retain cargo in the cargo compartment yet at least seventy-five percent of the screen member area is open through said air passages to permit air to flow therethrough to reduce the air drag associated therewith; and

closure means for selectively closing said air opening through said tailgate body to block said air passages through said screen member and retain cargo smaller than

said air passages in the cargo compartment, said closure means pivoted along one side of said air opening so that said closure means is pivotal between a closed position overlying said screen member and an open position in registration with said outer skin out of interference with said air opening and in juxtaposition with one side of said tailgate body.

4,200,329

REAR COMPARTMENT ARRANGEMENTS FOR VAN TYPE MOTOR VEHICLE

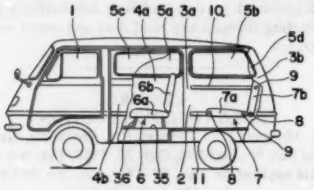
Fumiaki Inami, and Akiyosi Okada, both of Aki, Japan, assignors to Toyo Kogyo Co., Ltd., Aki, Japan

Filed Aug. 11, 1978, Ser. No. 933,039

Claims priority, application Japan, Aug. 16, 1977, 52-109883[U]; Aug. 17, 1977, 52-110413[U]

Int. Cl.[2] B60N *1/10*

U.S. Cl. 296—69 **7 Claims**



1. A seat and seat support means for converting the rear compartment of a van type vehicle into a space which can be used for multiple purposes, comprising:

a pair of spaced opposed side body coverings, a front wall and back wall making up the walls of said rear compartment;

at least one seat positioned in a rear portion of said rear compartment and including a cushioned seat portion and a separate reclining seat portion, said seat portions constituting a reclinable type seat;

engaging means on each of said seat-portions constituted by respective pairs of engaging members provided on opposite sides of said respective seat portions;

lower and upper pairs of supporting members fixedly attached to the inside surfaces of said space opposed side body-coverings, said supporting members extending in the direction of advance of said motor vehicle, each supporting member of each of said respective pairs of said supporting members being positioned at the same height above the van floor, said upper pair of said supporting members being positioned approximately midway of the vertical dimension of said rear compartment; and

a plurality of receiving means located on said supporting members for receiving said engaging members for supporting said seat portions in one of two positions, a first position wherein said cushioned seat portion is supported fully on the lower one of said pairs of said supporting members wherein said respective pairs of engaging members of said cushioned seat portion are received in said receiving means located on said lower pair of said supporting members, and said reclining seat portion having one of said respective pairs of said engaging members received in receiving means on said lower pair of support members and a second pair of said respective pairs of engaging members received in receiving means located on said upper pair of said supporting members for forming a reclinable type seat, and a second position wherein both said cushioned seat portion and said reclining seat portion are supported on said lower pair of supporting members in the same manner that said cushioned seat portion is supported in said first position, or both of said seat portions are supported on said upper pair of said supporting members.

4,200,330

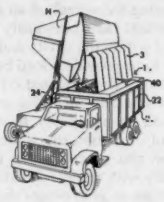
LOAD RETAINING DEVICE FOR SILAGE TRUCK

H. Edwin Scott, Rte. 2, Mebane, N.C. 27302

Filed May 25, 1978, Ser. No. 909,387

Int. Cl.[2] B60P *7/04*

U.S. Cl. 296—100 **5 Claims**



1. A load retaining device for attachment to the cargo bed of a wheeled vehicle, which cargo bed includes spaced side walls, a front wall, a rear wall, and an open top, said load retaining device comprising:

(a) a supporting frame of substantially the same dimensions as the open top of the cargo bed and including means for securely mounting said supporting frame over said open top;

(b) said supporting frame further including a platform segment substantially the same length as the side walls of the cargo bed and of such a width as to cover a minor portion of the open top of the cargo bed, said platform having an inner side edge extending lengthwise parallel to and adjacent one of said side walls when said frame is secured to said cargo bed;

(c) a cover segment of such dimensions as to cover a major portion of the open top of the cargo bed, said cover having opposed side edges substantially equal to the length of said platform, and a width dimension substantially greater than the width of said platform, said cover segment being pivotally mounted around one side edge to said platform;

(d) said supporting frame and said cover being covered by a lightweight sheel material whereby the contents of said cargo bed are enclosed when the cover is closed;

(e) power means mounted on said load retaining device and activated from within said vehicle for raising and lowering said cover segment about an axis of rotation extending parallel to the side walls of said cargo bed to selectively open and close the cargo bed.

4,200,331

FOLDING CHAIR

Suekichi Uchida, Aichi, Japan, assignor to Uchida Sharyo Co., Ltd., Nagoya, Japan

Filed Dec. 27, 1978, Ser. No. 973,700

Claims priority, application Japan, Jan. 14, 1978, 53/3061[U]

Int. Cl.[2] A47C *4/28*

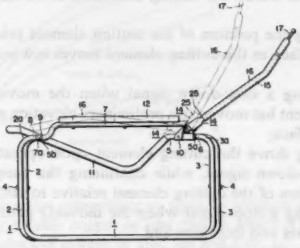
U.S. Cl. 297—45 **7 Claims**

1. In a folding chair comprising a pair of generally U-shaped tubular legs pivoted to each other at middle points of arm portions thereof, a pair of seat supporting members each having end portions connected to corresponding upper end portions of a respective one of said legs, a collapsible seat stretched between said seat supporting members, a pair of arm supporting members provided above said seat supporting members, a pair of arms mounted on the respective arm supporting members, a pair of backrest supporting members each mounted over a respective one of said legs so as to be foldable on said seat supporting members, and a collapsible backrest stretched between said backrest supporting members,

the improvement comprising:

cylindrical connectors inserted into those end portions of said seat supporting members and those upper end portions of said legs which are adjacent to said backrest supporting members for connecting said seat supporting members to said legs, and

a pair of backrest inclination adjusting mechanisms between said adjacent end portions of said seat supporting members and lower ends of said backrest supporting members, each of said backrest inclination adjusting mechanisms comprising a stationary cam mounted on said adjacent end



portion of said seat supporting member and having stepped cam surfaces formed on an end thereof which is remote from said adjacent end portion of said seat supporting member, a connecting member having one end pivoted to a base portion of said stationary cam and another end fixed to the lower end of said backrest supporting member, a rocking cam pivoted to said connecting member and having a cam surface selectively engageable with one of said cam surfaces of said stationary cam, and control means disposed in said connecting member for controlling the rocking movement of said rocking cam.

4,200,332

ADJUSTABLE CHAIR

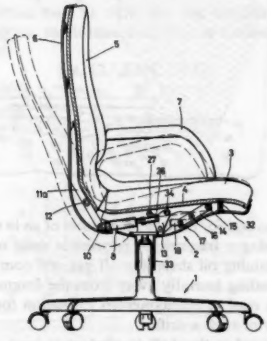
Egon Bräuning, Weil am Rhein, Fed. Rep. of Germany, assignor to Protoned B.V., Amsterdam, Netherlands

Filed Jul. 20, 1978, Ser. No. 926,266

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733322

Int. Cl.² A47C *1/032*

U.S. Cl. 297—300 **10 Claims**



1. A chair comprising: a seat, a back, a pedestal, pivoting means for connecting said seat and back to said pedestal for rocking motion about a substantially horizontal axis, adjustment means for steplessly adjusting the inclination of said seat and back in the same direction said adjustment means including a gas cylinder, and a mechanical compression spring having a spring force which is additive to the force from said gas compression cylinder, and boosts the effect thereof, and lockable valve means for alternatively locking said gas compression cylinder in an open and a closed position, said open position providing substantially constant force whereby a pleasant rocking motion is possible and said closed position providing substantial force resisting motion of said seat and back whereby said seat and back are locked in a selected substantially fixed inclined position.

4,200,333

ADJUSTABLE HINGE MOUNT FOR A SEATBACK

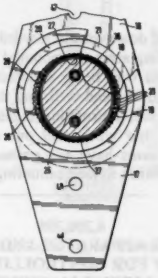
Heinz P. Cremer, and Paul Werner, both of Remscheid, Fed. Rep. of Germany, assignors to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Jul. 11, 1978, Ser. No. 923,649

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1977, 2733488

Int. Cl.² A47C *1/025*

U.S. Cl. 297—362 **17 Claims**



1. An arrangement for adjusting the inclination of a backrest component relative to a seat component of a seat, particularly a vehicle seat, comprising, in combination, at least one hinge including two hinge members coaxially mounted on each other for tilting about an axis and each being stationarily connected to one of the components of the seat and having an internal gear annulus of a diameter at least substantially equal to and a number of teeth different from those of the other gear annulus; and means for relatively tilting the hinge members, including a support element arranged within said annuli for rotation about said axis and having at least one eccentric support surface facing the teeth of said internal gear annuli, and an elastic band disposed on said support surface, and including a plurality of uniformly distributed pins meshingly engaging a portion of said gear annuli, and the number of said pins corresponding to the number of teeth of the internal gear annulus which has the smaller number of teeth.

4,200,334

TRANSPORT CONTAINER WITH A DEVICE FOR SIDE TIPPING

Jan E. Lindholm, Folkets Husgatan 13, S-810 70 Älvkarleby, Sweden

Filed Mar. 15, 1978, Ser. No. 886,686

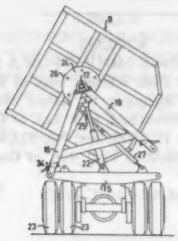
Claims priority, application Sweden, Mar. 17, 1977, 7703033

Int. Cl.² B60D *1/16*

U.S. Cl. 298—7 **6 Claims**

1. A freight vehicle having a chassis carrying a container, means to tip the container transversely to empty it, the bottom, side and end walls of the container (35; FIG. 7) being connected to each other, each end wall having an upper journalling means (17*a*) pivotably mounting one end of a pivoting arm (19; FIG. 7), the other end of said arm being pivotally (18*b*) connected to mounting means rigidly connected to the chassis, said tipping means comprising means for swinging both arms

(19*a*,19*a*) about two longitudinal coaxial pivots (18*b*) situated at one side of the vehicle, said journalling means (17*a*,17*a*) on the end walls being coaxial and situated at such a height above the bottom of the container that after swinging both the pivoting arms (19*a*,19*a*) upward for simultaneously lifting the container, the container tips in the upper journalling means (17*a*,17*a*) into a position in which one side wall (11*a*) of the



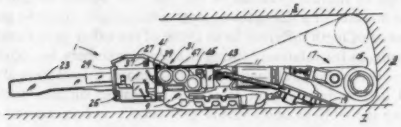
container is inclined downwardly toward that side of the vehicle where the pivoting arms are mounted (18*b*), the journalling means on either end wall being situated substantially on the vertical center line of the end wall, and the length of said arms and the height of said journalling means and said swinging means being such that when said one side wall is inclined downwardly, said arms have not passed over center above their pivotal connection to said mounting means.

4,200,335

GAUGING APPARATUS AND METHOD, PARTICULARLY FOR CONTROLLING MINING BY A MINING MACHINE

Daniel J. Moynihan, Belleville, and John A. L. Campbell, Mascoutah, both of Ill., assignors to Peabody Coal Company, St. Louis, Mo.

Filed Aug. 18, 1978, Ser. No. 934,998
Int. Cl.[2] E21C *35/04, 41/04*
U.S. Cl. 299—1 **42 Claims**



1. Apparatus for mining or excavating having a movable cutting element movable to different elevations and means for controlling the movement of said movable cutting element adapted to be pre-set to establish a predetermined final elevation at which the cutting element, in making a cut, is to be stopped, and to establish a predetermined preliminary elevation, in advance of the final elevation, at which the movement of the movable cutting element is to be slowed down, said apparatus comprising:

slow-down signal means pre-settable in accordance with said preliminary elevation for signalling when the movable cutting element, in making a cut, has moved to said preliminary elevation short of the said final elevation at which it is to be stopped;

stop signal means pre-settable in accordance with said final elevation for signalling when the movable cutting element has moved to its said predetermined final elevation for stopping the movable cutting element at said predetermined final elevation;

said slow-down signal means including first means for generating a slow-down signal;

said stop signal means including second means for generating a stop signal; and

means operable by said movable cutting element for actuating said first signal generating means for actuating the slow-down signal means when the movable cutting element has moved to the said preliminary elevation and for actuating said second signal generating means for actuating the stop signal means when the movable cutting element has reached its said final elevation.

24. In mining or excavating, the method of controlling a movable cutting element in the movement thereof to a seam interface at which the cutting element is to be stopped, comprising:

gauging the position of the cutting element relative to the interface as the cutting element moves toward said interface;

operating a slow-down signal when the movable cutting element has moved to a preliminary elevation short of said interface;

slowing down the cutting element upon operation of said slow-down signal, while continuing the gauging of the position of the cutting element relative to said interface;

operating a stop signal when the movable cutting element reaches said interface; and

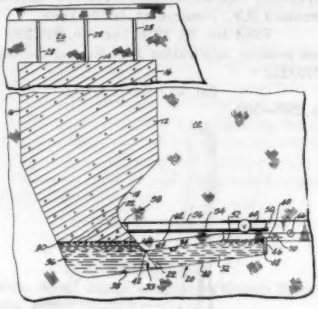
stopping the cutting element upon operation of said stop signal.

4,200,336

MEANS FOR PROVIDING GAS SEAL IN PRODUCTION LEVEL DRIFT FOR IN SITU OIL SHALE RETORT

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 17, 1978, Ser. No. 924,982
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **32 Claims**



1. An off gas seal for closing the bottom of an in situ oil shale retort containing a fragmented permeable mass of formation particles containing oil shale, the off gas seal comprising:

a drift extending laterally away from the fragmented mass, leaving a roof of unfragmented formation forming a top boundary of such a drift;

sufficient liquid in the drift to contact at least a portion of such a roof of unfragmented formation for forming a gas seal for inhibiting flow of gas from the fragmented mass through the drift past the gas seal;

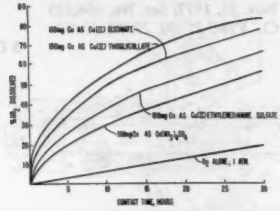
a passage bored through unfragmented formation above the gas seal; and

means extending through the passage for withdrawing off gas from the fragmented mass.

4,200,337
CATALYSES OF URANIUM OXIDATION

John F. Jackovitz, Monroeville Boro., and Earl A. Pantier, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 15, 1978, Ser. No. 915,647
Int. Cl.[2] E21C 41/14; C01G 56/00
U.S. Cl. 299—5 14 Claims



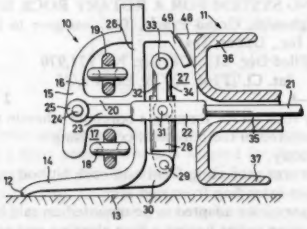
1. A composition comprising an aqueous solution of
(1) a water-soluble copper or zinc chelate which is the reaction product of copper or zinc ion and a bi-, tri-, quadra-, penta-, or hexa- dentate chelating agent, said chelating agent containing at least two donor groups selected from the group consisting of amino, carboxylic acid, thiocarboxylic acid, and mixtures thereof;
(2) carbonate or bicarbonate ion; and
(3) an oxidizing agent.

8. In a process for solution mining uranium by pumping a solution containing an oxidizer and an extractant of carbonate or bicarbonate ion into an underground uranium deposit, a method of catalyzing the oxidation of said uranium by said oxidizer comprising including in said solution a water-soluble copper or zinc chelate which is the reaction product of copper or zinc ion and a bi, tri-, quadra-, penta-, or hexa- dentate chelating agent, said chelating agent containing at least two donor groups selected from the group consisting of amino, carboxylic acid, thiocarboxylic acid, and mixtures thereof.

4,200,338
MINERAL MINING INSTALLATION

Klaus Beckmann, Lunen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,942
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2751016
Int. Cl.[2] E21C 27/32
U.S. Cl. 299—43 17 Claims

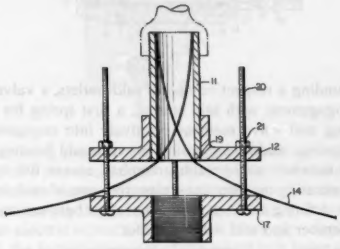


1. A mineral mining installation comprising: a conveyor constituted by a plurality of conveyor sections; a guide arranged on one side of the conveyor and constituted by a plurality of guide sections, each guide section having a corresponding conveyor section associated therewith; and a control apparatus associated with each respective guide section and corresponding conveyor section, said control apparatus having guide rod means, one end of which is pivotally connected to the respective guide section, and a hydraulic control ram pivotally connected to the respective guide section and to an intermediate portion of the guide rod means, the hydraulic control ram being operable to pivot that guide section relative to the corresponding conveyor section about the pivotal connection between that guide section and the associated guide rod means, thereby to control the cutting horizon of a mineral mining machine moving along said guide.

4,200,339
METHOD OF MAKING A CHIMNEY SWEEPING BRUSH

William L. Lichliter, Rte. 5, Box 781, and Dennis N. Compton, 609 Bruce St., both of Winchester, Va. 22601

Filed Oct. 12, 1978, Ser. No. 950,552
Int. Cl.[2] A46D 3/00; A46B 9/10
U.S. Cl. 300—21 4 Claims



1. A method of manufacturing a chimney cleaning brush including the steps of:
(a) assembling a pipe flange to a pipe nipple with the planar surface of the flange flush with a first end of the pipe nipple,
(b) positioning the assembled pipe flange and nipple in a support so that the planar surface of the flange is horizontal and faces upwardly,
(c) cutting lengths of wire from a loosely formed roll of spring wire so that each length of wire retains a pre-formed curvature,
(d) inserting a quantity of the pre-formed lengths of wire downwardly into the assembled pipe flange and pipe nipple so that each length of wire projects upwardly and curves downwardly from the top of the planar surface of the pipe flange,
(e) inserting a second pipe flange into the center of the flared out bundle of pre-formed wire bristles, the second pipe flange having its planar surface facing toward and in axial alignment with the first pipe flange, and
(f) fastening the planar surface of a second pipe flange to the planar surface of the first pipe flange to secure the quantity of pre-formed curved lengths of spring wire to the assembled first pipe flange and nipple assembly.

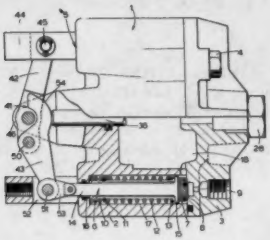
4,200,340
CONTROL VALVE ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

Hugh G. Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed Aug. 22, 1978, Ser. No. 935,971
Claims priority, application United Kingdom, Aug. 23, 1977, 35203/77
Int. Cl.[2] B60T 15/06
U.S. Cl. 303—6 A 5 Claims

1. A control valve assembly for a vehicle dual hydraulic braking system comprising a housing provided with a distributor chamber, and first and second outlets for connection to brakes on wheels on opposite sides of said vehicle, separate brake-applying valves in said housing operable independently

or simultaneously to cause fluid in said chamber to be supplied to one or both of said outlets, a valve-operating mechanism for controlling pressurisation of said distributor chamber, and a brake-applying mechanism for operating said valve-operating mechanism and for controlling operation of said brake-applying valves when at least one pedal of a pair of pedals is operated, wherein each brake-applying valve comprises a seating



surrounding a respective one of said outlets, a valve member for engagement with said seating, a first spring for normally biassing said valve member positively into engagement with said seating, said spring acting between said housing and said valve member, an operating member, means for connecting said operating member to a respective one of said pedals, and means defining a lost-motion connection between said operating member and said valve member.

4,200,341

BEARING SEALING ARRANGEMENT

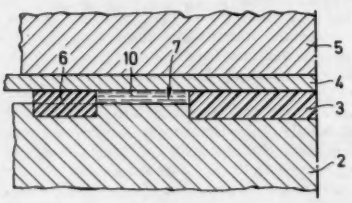
Wolfgang Kauschke, Haan, Fed. Rep. of Germany, assignor to Glacier GmbH-Deva Werke, Stadtallendorf, Fed. Rep. of Germany

Filed Jan. 13, 1978, Ser. No. 869,231

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1977, 2701672

Int. Cl.[2] **F16C** *29/00, 33/74;* **E01D** *19/06*

U.S. Cl. 308—3.5 **8 Claims**



1. A sealing arrangement for a sliding bearing for carrying heavy loads, comprising: two plate-shaped bearing metal sections displaceable relative to each other; sliding plates fastened between said two bearing metal sections; one of said sliding plates being larger than the other; lubricating means applied between said sliding plates; a sealing strip enclosing a mutually sliding surface of said sliding plates at a distance therefrom and being supported by the bearing metal section carrying the smaller sliding plate, said sealing strip contacting and sealing the surface of the larger sliding plate; gap means formed between the sealing strip and the smaller sliding plate, said gap means being completely filled with lubricating means, and said sealing strip being of flexible spongy absorbent material and stretched elastically under pressure of initial lubricating means filling in said gap. means; said gap means filled with said lubricating means providing a pressurized source of said lubricating means to replenish the lubricating means between said sliding plates, said elastically stretched sealing strip maintaining said lubricating means in said gap means in a pressurized condition.

4,200,342

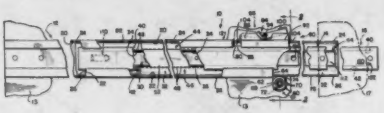
COMBINATION SOLID BEARING AND BALL BEARING SLIDE

Martin K. Fall, Indianapolis, Ind., assignor to Herbert S. Fall, Indianapolis, Ind.

Filed Nov. 25, 1977, Ser. No. 854,825

Int. Cl.[2] **F16C** *21/00, 29/00, 35/02*

U.S. Cl. 308—3.8 **5 Claims**



1. A slide assembly comprising a first track member providing a pair of first tracks, a second track member providing a pair of second tracks engaging the first tracks and a third pair of tracks, each of the first, second and third pairs of tracks including an upper track and a lower track, and the third track member providing a fourth pair of tracks, the first, second and third track members each having a proximal end and a distal end, the first track member being stationarily mounted on a cabinet and the third track member being stationarily mounted on a drawer extensible outwardly from, and retractible inwardly into, the cabinet, the first, second and third track members extending longitudinally of one another, the second track member being movable outwardly and inwardly longitudinally from the distal end of the first track member and the third track member being movable outwardly and inwardly longitudinally of the distal end of the second track member, the first and second track members being longitudinally slidably connected by engagement of respective tracks of the first and second pairs, and the second and third track members being longitudinally slidably connected by interpositioning between each track of the third pair and a respective track of the fourth pair a plurality of bearings, the first tracks being disposed on the first track member in facing relation, the second tracks being disposed on the second track member for engagement in the respective first tracks, the third tracks being mounted on the second track member in nested orientation to the second tracks and in oppositely facing relation to one another, and the fourth tracks being disposed in facing relation to lie between respective second and third tracks, the first track member including roller means for bearing weight of the extended second and third track members and drawer.

4,200,343

SEALING SYSTEM FOR A ROTARY ROCK BIT

Albert E. Highsmith, Grand Prarie, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 21, 1978, Ser. No. 971,970

Int. Cl.[2] **F16C** *33/78;* **E21B** *9/35*

U.S. Cl. 308—8.2 **2 Claims**

1. A rotary rock bit for forming a borehole wherein materials are encountered in the borehole, comprising:

a rock bit body;

at least one arm projecting from said rock bit body;

a bearing pin extending from said arm;

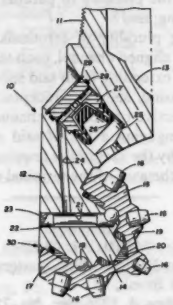
a rolling cone cutter adapted to be mounted on said bearing pin, said cone cutter having a base abutting said arm and a concave cavity projecting from a cone mouth, said cavity and cone mouth positioned over said bearing pin;

bearing and cutter retaining means in said cavity between said bearing pin and said cone cutter;

an annular seal space in said cone cutter located in said cone mouth;

a tough, resilient and abrasion-resistant three sided protect-

ing ring in said annular seal space located in said cone mouth adjacent said base between said arm and said cone cutter, said protecting ring having a curved side facing away from said arm and two sides meeting at an angle adjacent said base; and



a compressed elastomer O-ring positioned between said cutter and said bearing pin and located in said cavity inside said protecting ring and contacting said curved side of said protecting ring for preventing entry of materials in the borehole into said cavity.

4,200,344

MAGNETIC DISC STORES

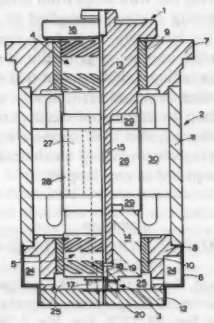
Kenneth J. Binns, Chandler's Ford, and Ronald W. Woolley, Poole, both of England, assignors to The University of Southampton, Southampton, England

Filed Mar. 20, 1978, Ser. No. 888,419

Claims priority, application United Kingdom, Mar. 24, 1977, 12365/77

Int. Cl.[2] F16C *7/04, 35/00*

U.S. Cl. 308—9 **12 Claims**



1. Drive and support means for magnetic disc stores comprising a drive spindle which is adapted for direct connection to a disc pack, a pair of self-acting air bearings which support the spindle with its axis vertical, an alternating current synchronous motor comprising a rotor which is connected to the spindle between the bearings and carries permanent magnets, and a stator which surrounds the rotor and produces a rotating magnetic field which interacts with magnetic poles provided at the periphery of the stator by the magnets, means at the upper end of said spindle for connecting said spindle to a disc pack, and a self-acting fluid thrust bearing at the lower end of said spindle for supporting the weight of said spindle.

4,200,345

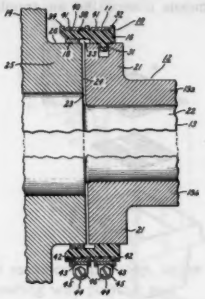
LARGE-DIAMETER DUST GUARD FOR A LOCOMOTIVE AXLE BEARING

Dale C. Walker, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Jul. 25, 1978, Ser. No. 927,786

Int. Cl.[2] F16C *33/72*

U.S. Cl. 308—36.1 **11 Claims**



1. For covering the axial gap between a rotatable metal hub of a wheel of a traction vehicle and the adjacent metal thrust flange of a motor supporting axle bearing disposed on the axle of the wheel in a cap that is fastened to the relatively stationary frame of an electric motor whose rotor is drivingly coupled to the wheel, the outside diameter of the wheel hub being of the order of 25 centimeters or larger, an improved dust guard located in a relatively narrow space defined on one side by said wheel and on the other side by said axle bearing cap and by the housing of said motor, said dust guard comprising:

(a) a strip of elastomeric material having sufficient length to be snugly wrapped around the thrust flange of the axle bearing where it forms a continuous annular band except for a single split at abutting ends of the strip, said strip of elastomeric material having sufficient width so that a portion of said annular band overlaps the perimeter of the wheel hub, whereby said annular band covers the gap between the wheel hub and the axle bearing thrust flange;

(b) first means for firmly securing said annular band to the circumference of the axle bearing thrust flange; and

(c) second means for applying radial pressure to said overlapping portion of said annular band so as to maintain said overlapping portion in compression between said second means and said wheel hub, said second means comprising a flexible metal member of fixed length encircling said overlapping portion and clamping means for releasably fastening one end of said member to a part of said member near its opposite end, said clamping means including manually operable means for adjustably applying tangential force to said encircling member which consequently is put in tension, whereby said member will exert a desired amount of radial pressure substantially uniformly around the outside circumference of said overlapping portion of said annular band, said clamping means being so constructed and arranged that the maximum obtainable pressure on the perimeter of said wheel hub is less than approximately 40 kilograms per square centimeter.

4,200,346

PORTABLE AND NESTABLE STORAGE BIN

Paul Belokin, Jr., Rte. 4, Hayward, Wis. 54843

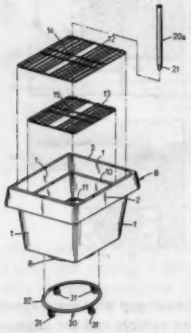
Filed Oct. 16, 1978, Ser. No. 951,374

Int. Cl.[2] A47F *3/14*

U.S. Cl. 312—351 **10 Claims**

1. A portable, lightweight, and nestable storage bin molded from expandable polystyrene and comprising; side wall means,

a closed bottom and an open top, said side wall means terminating in an upper edge and also having a thicker, reinforcing portion so as to rigidify and strenghten said upper edge of said bin, said side wall means also having an interior inwardly turned shoulder intermediate the height of said side wall means, a removable rack supported on said shoulder for supporting material in said bin, said bin adapted to receive ice to maintain said material at a reduced temperature, said bottom also having wheel mounting means on the underside thereof, said mounting means comprising an annular recess formed



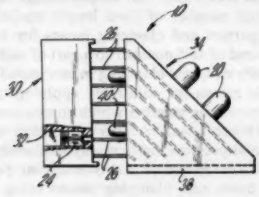
completely around the periphery of said bottom and defining a generally vertical cylindrical shoulder and also defining a generally horizontal shoulder, a removable wheel assembly having floor engaging caster wheels thereon, and said wheel assembly including a ring into which said vertical cylindrical shoulder is inserted by being slipped downwardly therein and on which generally horizontal shoulder the ring bears in supporting relationship, said mounting means on said bin bottom adapted to be quickly removably mounted on said assembly for rendering said bin mobile.

4,200,347

SOCKET FOR VERTICALLY MOUNTING MULTI-PIN DEVICE

William Y. Sinclair, Stockton, N.J., and Joseph Argila, Upper Black Eddy, Pa., assignors to Aries Electronics, Inc., Frenchtown, N.J.

Filed Jan. 15, 1979, Ser. No. 3,629
Int. Cl.[2] H05K *1/12*
U.S. Cl. 339—17 CF **25 Claims**



1. A socket for vertically mounting multi-pin electronic devices comprising:

an elongated housing having a plurality of parallel channels extending therethrough;

a generally triangular housing having first, second, and third side edges, said triangular housing having a corresponding plurality of parallel channels extending therethrough from said first side edge to said second side edge, said triangular housing being connected to said elongated housing along said first side edge such that the plurality of channels in the elongated housing are aligned with the corresponding plurality of channels in the triangular housing, said triangular housing including a generally triangular center body portion connected to two opposed, triangular-shaped cover portions, each cover portion including parallel slots on the inside surface thereof to define with the center body portion the plurality of parallel channels in the triangular housing; and

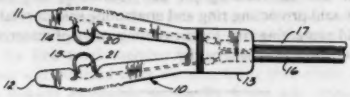
a corresponding plurality of terminals, each of which is disposed in an aligned channel, each terminal including (1) a post portion extending from said second side edge of the triangular housing, and (2) a receptacle portion received within a respective one of said channels in the elongated housing for engaging a pin of said multi-pin electronic device, whereby the axes of the terminal posts portions are at an angle to the axes of the terminal receptacle portions.

4,200,348

MEDICAL CLIP

Lawrence J. Stupay, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Aug. 4, 1976, Ser. No. 711,455
Int. Cl.[2] H01R *11/22*
U.S. Cl. 339—61 R **4 Claims**



1. A terminal clip for use with electrodes of the general type having a male projection with an enlarged diameter head portion thereon, comprising a pair of support arms secured together at one end and normally spaced from each other at the other end, a resilient conductive wire loop extending from each of said arms at points spaced from said one end and overlappable with each other when the arms are moved toward each other to form an aligned aperture sufficiently large to pass said head portion when so overlapped, electrical conductor means connected to said wire loops, and means urging said arms apart to prevent the wire loops from being so overlapped unless external closing forces are applied to said arms, said support arms being integrally formed of resilient dielectric plastic with an initial unstressed generally V-shaped, at least one of said arms including a shalf carried thereby and projecting toward the other arm and transversely spaced from its respective wire loop to cover said head portion when said loops are so overlapped, said shelf cooperating with the arm toward which it projects providing an abutted condition signalling that the loops are so overlapped.

4,200,349

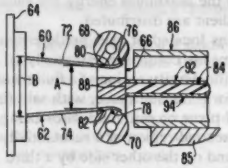
LOW FORCE PRINTED CIRCUIT BOARD CONNECTOR APPARATUS

Richard W. Holland, Los Gatos, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 10, 1979, Ser. No. 2,285
Int. Cl.[2] H05K *1/07*
U.S. Cl. 339—75 MP **3 Claims**

1. A connector apparatus for a printed circuit board comprising: a base; a first resilient contact member secured to and extending from said base: a second resilient contact member secured to and extending from said base, said second resilient contact member spaced from said first resilient contact member; a body; means operatively connected with the body and the contact members for providing that as a printed circuit board edge is inserted between the contact members to contact and move the body, the resilient contact members are urged and moved against the resilience thereof to bring portions thereof into contact with the respective opposite sides of the

printed circuit board, wherein the means operatively connected with the body and contact members comprise first and



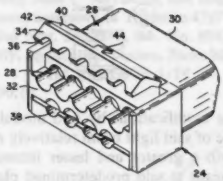
second rollers rotatably mounted to the body, the contact members extending between the first and second rollers.

4,200,350

TOOLLESS RETENTION SYSTEM

John A. Zimmerman, Jr., Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 20, 1978, Ser. No. 888,443
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **9 Claims**



1. An improved electrical connector providing toolless retention and release of electrical terminals carried thereby, said connector comprising:

a housing of rigid insulative material defining therein a forwardly opening cavity, at least one aperture in a sidewall of said housing spaced from said opening of said cavity; and

a terminal carrying insert member having a plurality of terminal carrying passages extending therethrough from a mating face to a rear face, at least one cover, each said cover being hingedly attached by one end to said insert member intermediate the faces thereof and having an inwardly directed abutment on the opposite free end, each said cover being moveable between a first position with the abutment on said free end substantially blocking the rear of said terminal passages and preventing withdrawal of terminals contained therein to a second normal position in which said abutment free of said passages, and an outwardly directed lug on said cover portion, whereby terminals inserted into said passages are held therein by closure of said at least one cover portion and said insert member is held in the cavity of said housing by engagement of each said lug in a respective aperture.

4,200,351

STRAIGHT THROUGH ELECTRICAL SPRING PROBE

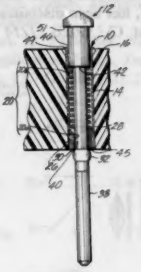
Everett J. Long, Claremont, and Elmer W. Muench, Covina, both of Calif., assignors to Everett/Charles, Inc., Pomona, Calif.

Filed Jun. 12, 1978, Ser. No. 914,393
Int. Cl.² H01R *13/16*
U.S. Cl. 339—108 TP **26 Claims**

1. A straight through electrical spring probe comprising:

an elongated resilient thin wall tubular member comprising a passage and a slit along the entire length thereof, a transversely enlarged wall portion and a wall portion transversely inwardly extending, relative to the enlarged portion, into the passage, thereby forming a stop;

an elongated plunger member telescoped in the passage of the tubular member and comprising a probe head exposed at one end, a connector portion exposed at the other end



of the tubular member and a stop, larger in size than the inwardly extending wall portion; and

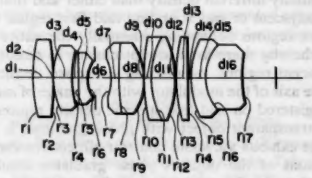
a compression spring for urging the telescoped plunger and tubular member in opposite directions until the stops in the tubular member and on the plunger are in engagement.

4,200,352

LENS SYSTEM FOR MICRO FILM

Koichi Yuta, Mitaka, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 9, 1978, Ser. No. 932,219
Claims priority, application Japan, Aug. 17, 1977, 52/98438
Int. Cl.² G02B *13/14, 9/64*
U.S. Cl. 350—1.2 **4 Claims**



1. A lens system for micro film comprising a first positive lens component, a second meniscus lens component, a third negative lens component, a fourth cemented doublet component having a concave surface on the object side, a fifth positive cemented doublet component, a sixth positive lens component and a seventh cemented doublet component having a concave surface on the image side and consisting of a negative lens element and a positive lens element, and said lens system satisfying the following conditions:

(1) $1.49f < r_4 < 1.51f$

(2) $-0.02f < 1/r_5 < 0.08/f$

(3) $0.46f < r_6 < 0.48f$

(4) $-0.47f < r_7 < -0.45f$ wherein the reference symbols r_4, r_5 and r_6 represent radii of curvature of the image side surface of the second lens component, the object side surface and image side surface of the third lens component and object side surface of the fourth lens component respectively and the reference symbol f designates focal length of the entire lens system as a whole.

4,200,353
MODULATION CONTRAST MICROSCOPE WITH THREE REGIONS

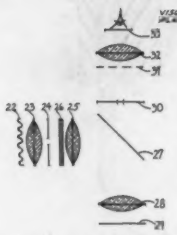
Robert Hoffman, 17 Copper Beach Pl., Merrick, N.Y. 11566

Continuation of Ser. No. 476,518, Jun. 5, 1974, abandoned. This application Apr. 21, 1978, Ser. No. 898,619

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.[2] G02B *21/14*

U.S. Cl. 350—13 **20 Claims**



1. A modulation contrast microscope comprising means for supporting an object at an object position, means for providing a beam of rays of light for illuminating the object, condenser means for concentrating the beam on the object position, an objective focused on the object position for receiving the beam after it has left the object, means for viewing the image, an aperture placed below said condenser means in a plane conjugate to the Fourier transform plane in back of the objective, and a modulator having different density regions located at the Fourier transform plane behind the objective, said modulator consisting essentially of three regions, a substantial first specific density region with said first region positioned in the transform plane on said modulator such that the light intensity may be modified relatively about said first region in both a greater and lesser intensity, a second substantial immediately adjacent region of a substantially different density adjacent to and bounding said first region to the right and a third region of a substantially different density than either said first or second regions adjacent to and bounding said first region to the left, said three regions occupying essentially the entire transform plane, whereby there is an abrupt change in density between said adjacent regions, manifesting a stepped density function along one axis of the modulator with the image of said aperture being registered on said first specific density region, whereby when a transparent object with phase gradients is examined, the image exhibits viewable contrast effects corresponding to the portions of the object's phase gradients resulting from modifications by the modulator of the amplitude of the light beams transmitted through it and relatively about said first region in both a greater and lesser intensity, with said image of said object appearing three dimensional.

4,200,354
MICROSCOPY SYSTEMS WITH RECTANGULAR ILLUMINATION PARTICULARLY ADAPTED FOR VIEWING TRANSPARENT OBJECTS

Robert Hoffman, 17 Copper Beech Pl., Merrick, N.Y. 11566

Continuation of Ser. No. 503,394, Sep. 5, 1974, abandoned. This application Apr. 21, 1978, Ser. No. 898,647

The portion of the term of this patent subsequent to Apr. 29, 1997, has been disclaimed.

Int. Cl.[2] G02B *21/14*

U.S. Cl. 350—13 **9 Claims**

1. An optical system particularly adapted for use in microscopy and useful for viewing phase objects with the aid of a light beam, comprising:

(a) means including an objective and a condenser lens in an optical path for focussing said light beam at a predetermined plane in said optical path, said object located between said objective and condenser lenses in said optical path, with said predetermined plane manifesting a Fourier transform plane whereby the spatial frequencies of said object as well as the maximum energy for each point on said object's gradient are distributed,

(b) modulator means located at said predetermined plane, said modulator means consisting essentially of three regions, a first specific density region of a finite width and of substantially uniform transmittance, with said first region positioned in said plane on said modulator being bounded on one side by a second region of a substantially different uniform density and on the other side by a third region of a substantially different density than said first or second regions, such that the light intensity may be modified about said first region in both a greater and lesser intensity, to cause modifications by said modulator means of the amplitude of said light beam relatively about said first region in both a greater and lesser intensity, with said modulator means at said predetermined plane occupying the entire optical path of said microscope, with said first region being of a grey density with one of said second and third being black and the other being clear, and

(c) an illumination source positioned in a plane conjugate to said predetermined plane for illuminating said object, said illumination source comprising a lamp assembly of the type having a relatively planar filament arrangement to provide a rectangular illumination pattern capable of being registered at said first region of said means to cause light from said object to be altered by said modulator means to provide an image of said object appearing three dimensional.

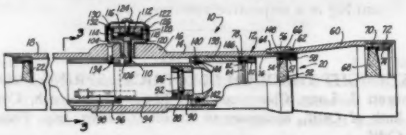
4,200,355
TELESCOPIC SCOPE HAVING AN INTEGRALLY FORMED SADDLE

John B. Williams, Jr., Fullerton, Calif., assignor to Fontaine Industries, Inc., Garden Grove, Calif.

Filed Aug. 8, 1978, Ser. No. 931,939

Int. Cl.[2] G02B *27/32*

U.S. Cl. 350—10 **9 Claims**



1. In a telescopic scope of the type having a tubular member, said tubular member capable of fitting into scope mounting rings attaching said scope to a firearm, at least one eye-piece lens means proximal to one end of said tubular member, at least one objective lens means proximal to the other end of said tubular member, an erector means intermediate said eye-piece

lens means and said objective lens means, a reticle means intermediate said eye-piece lens means and said objective lens means, turret means, the improvement which comprises:

said tubular member including a one-piece integrally formed main tube;

said tubular member including a saddle integrally formed on said main tube intermediate the ends of said main tube, said saddle circumventing said main tube;

said scope mounting rings attaching to said main tube;

said erector means including an erector tube;

said erector tube fitting inside said main tube;

at least one erector lens means;

said erector lens means mounted in said erector tube;

said saddle and said main tube including at least one passage hole;

said passage hole normal to the longitudinal axis of said main tube;

said turret means mounted on said saddle;

at least one erector adjustment linking member means;

said erector adjustment linking member passing through said passage hole to the interior of said main tube and linking said turret means to said erector tube.

4,200,356

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

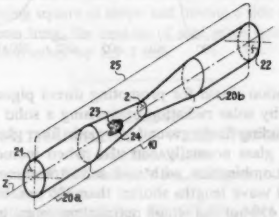
Thaddéus Hawkes; Jean C. Reymond, and Roger Trocellier, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 25, 1977, Ser. No. 854,893

Claims priority, application France, Nov. 30, 1976, 76 36069

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.16 **8 Claims**



1. An optical coupler for connecting optical signal transmission lines in an optical communication system, such that an optical signal in anyone of the lines of a first group of lines is transmitted to all other lines of a second group, each of said lines comprising at least one optical waveguide, said coupler comprising: a propagation medium having a revolution shape about an optical propagation axis and including first and second planar endfaces substantially perpendicular to said axis; at least one optical mixer in the form of an elongated cylindrically shaped rod having first and second planar and parallel faces, said first face constituting said first endface; first and second elongated rods in the shape of truncated cones forming a bi-conical structure each having parallel and planar faces namely a major base and a minor base and being united end to end by their minor bases which are identical, said first frusto-conical rod being further united by its major base to said second face of said optical rod mixer whose cross-section corresponds to the associated major base; layer means surrounding said propagation medium except said planar endfaces for reflecting light that impinges upon the peripheral surface thereof; and support means for connecting said transmission lines to said endfaces respectively such that the optical waveguides of which a group of transmission lines is comprised terminate parallel to the said optical propagation axis with waveguide endfaces disposed in a plane substantially adjacent to the corresponding endface; the diameters of said bases and axial length of said bi-conical structure being determined to provide a substantially hemispherical radiation pattern at said minor bases no matter what is the direction of the optical propagation along said axis, given the numerical aperture value of each of the associated group of transmission lines.

4,200,357

PHOTO EYEPIECE FOR MICROSCOPES

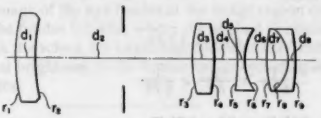
Hideo Itaya, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,994

Claims priority, application Japan, Jun. 29, 1977, 52/76532

Int. Cl.² G02B *3/00, 25/00*

U.S. Cl. 350—175 E **5 Claims**



1. A photo eyepiece for microscopes comprising a front lens group comprising a first positive meniscus lens component having a convex surface on the object side, and a rear lens group comprising a second lens component having positive refractive power, a third negative lens component and a fourth lens component having positive refractive power, at least one of said second and fourth lens components being a cemented doublet consisting of a positive lens element and a negative lens element, and said photo eyepiece satisfying the following conditions:

(1) $2.7 \leqq f_1/f_{234} \leqq 5.0$

(2) $0.72 \leqq d_2/f \leqq 1.25$

(3) $0.12 \leqq (n_a - n_b)f/|r_{ab}| \leqq 0.26$

wherein the reference symbol f represents the focal length of the lens system as a whole, the reference symbol f_1 designates the focal length of said front lens group, the reference symbol f_{234} denotes the focal length of said rear lens group, the reference symbol d_2 represents the airspace between the front and rear lens groups, the reference symbol r_{ab} designates radius of curvature on the cemented surface formed in the rear lens group, the reference symbols n_a and n_b denote refractive indices of the respective lens elements of the cemented component, n_a being the refractive index of the positive lens element and n_b being the refractive index of the negative lens element.

4,200,358

WIDE-ANGLE TYPE ZOOM LENS

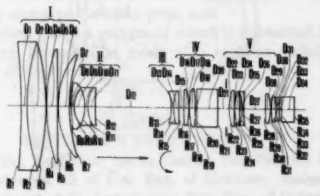
Sadahiko Tsuji, Yokohama, and Yasuhisa Sato, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1978, Ser. No. 919,770

Claims priority, application Japan, Jul. 8, 1977, 52/81570

Int. Cl.² G02B *15/18*

U.S. Cl. 350—184 **4 Claims**



1. A wide angle type zoom lens comprising, from the direction in which light enters,

a first lens group consisting of negative, positive, positive and positive lenses, and having a positive refractive power, said group being axially movable for focusing;

a second lens group consisting of a negative meniscus lens of forward convexity and a negative cemented lens of nega-

tive and positive lenses and having a negative refractive power;

a third lens group consisting of a negative cemented lens of negative and positive lenses, whereby when said second lens group is axially moved to effect zooming, said third lens group performs image shift compensating movement;

a fourth lens group having a positive refractive power and having a function of making substantially afocal the light bundle existing therefrom; and

a fifth lens group having a positive refractive power and having an image forming function, said wide angle type zoom lens being characterized by the following relationships:

$$1.5\ Fw < |F2| < 2.1\ Fw \quad (1)$$

$$-\frac{1}{6\,F1} < \frac{1}{R1} < \frac{1}{6\,F1} \quad (2)$$

$$0.65\ F1 < R6 < 0.75\ F1 \quad (3)$$

$$3|F2| < R8 < 5|F2| \quad (4)$$

$$0.05 < N7 - N6 < 0.25 \quad (5)$$

$$24 < \frac{\nu 5 + \nu 6}{2} - \nu 7 < 36 \quad (6)$$

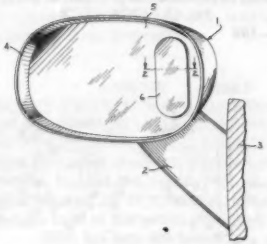
wherein Fw is the focal length of the entire system in the wide angle side; F1 is the focal length of the first lens group; F2 is the focal length of the second lens group; R1 is the radius of curvature of the first surface in the first lens group; R6 is the radius of curvature of the front surface of the last lens in the first lens group; R8 is the radius of curvature of the first surface in the second lens group; N6 is the refractive index for the spectral d line of the negative lens of the cemented lens in the second lens group; N7 is the index of refraction for the spectral d line of the positive lens of the cemented lens in the second lens group; $\nu 5$ is the Abbe number for the spectral d line of the negative meniscus lens in the second lens group; $\nu 6$ is the Abbe number for the spectral d line of the negative lens of the cemented lens in the second lens group; and $\nu 7$ is the Abbe number for the spectral d line of the positive lens of the cemented lens in the second lens group.

4,200,359

SIDE VIEW MIRROR ASSEMBLY WITH BUTYL RUBBER ADHESIVE

David E. Lawson, 701 Riford Rd., Glen Ellyn, Ill. 60137

Filed Nov. 24, 1978, Ser. No. 963,450
Int. Cl.[2] A47G 1/17; G02B 5/08
U.S. Cl. 350—303 3 Claims



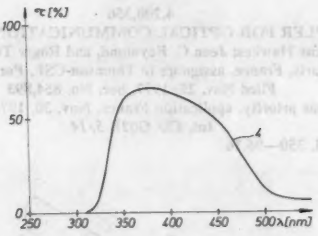
1. A mirrorr assembly to be attached to a vehicle, comprising a first mirror, a second flat mirror having an area substantially smaller than the first mirror, a wedge-shaped block of butyl rubber disposed between said mirrors and bonded to said mirrors, said butyl rubber having a pentarometer value of 7.23 to 9.16 mm, a rebound test value of 0.280 to 0.565 mm and a Shore "00" hardness in the range of 63 to 65 at 72° F., said block having a configuration such that the second mirror is disposed at an acute angle with respect to said first mirror to enable the motorist to view an area forward of the normal line of vision of said first mirror and eliminate the "blind spot", said block having pressure sensitive adhesive properties to enable the block to be attached to both of said mirrors without the use of auxiliary adhesives.

4,200,360

FILTER FOR PROTECTION AGAINST RADIATION, ESPECIALLY WITH REGARD TO DIRECT PIGMENTATION BY SOLAR RADIATION

Maxim F. Mutzhas, Pilgersheimerstrasse 64, BRD 8000 München 90, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 773,844, Mar. 3, 1977. This application Mar. 11, 1977, Ser. No. 776,518
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609273
Int. Cl.[2] G02B 5/20
U.S. Cl. 350—316 12 Claims



1. A radiation shield for promoting direct pigmentation of human skin by solar radiation comprising a solid translucent material including finely ground inorganic filter glass particles, which filter glass normally and also when included as said particles in combination with said solid translucent material filters out all wave lengths shorter than 320 nm, blocks wave lengths over 450 nm and which permits maximum transmission of wave lengths in the range of 320 to 450 nm.

4,200,361

LIQUID CRYSTAL MIRROR FOR USE AS A REAR-VIEW MIRROR FOR VEHICLES

Renato Malvano; Marco Omini, and Natalino Carli, all of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Jan. 17, 1978, Ser. No. 870,166
Claims priority, application Italy, Jan. 25, 1977, 67156 A/77
Int. Cl.[2] G02F 1/13
U.S. Cl. 350—336 1 Claim

1. A liquid crystal rear-view mirror, for use in a vehicle, of the type comprising:

a body adapted to be attached to the vehicle,

a number of optical elements supported by said body and including a transparent electrically insulating front plate,

a thin transparent first layer of electrically conductive material covering the rear surface of the front plate,

a rear electrically insulating plate spaced from said front plate and having a front surface facing the said rear surface of said front plate and a rear surface opposite to its front surface,

a second thin transparent layer of electrically conductive material covering said front surface of the rear plate,

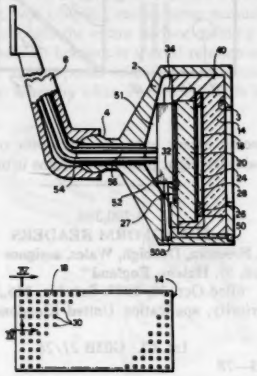
a reflecting layer on said rear surface of the rear plate,

a band of insulating material interposed and fluid-tightly sealed between said front and rear plates around the peripheries of said rear and front surfaces to define a cell between said plates,

a film of liquid crystal in nematic form contained within said cell, and

means for connecting said conductive layers electrically to a voltage source to create an electric field in the liquid crystal film,

wherein the improvement consists in said first layer of electrically conductive material having a lattice form bounded by straight mutually perpendicular lines which define a number of exposed areas of said rear surface of said front plate free of electrically conductive material, said exposed areas being square in shape and having a side substantially 0.3–1 mm long, the centres of said areas being separated from each other by 1.5–3 mm.



4,200,362

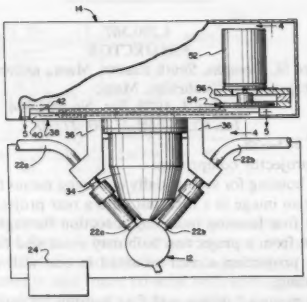
OPHTHALMOSCOPE WITH UNIFORM ILLUMINATION

Oleg Pomerantzeff, Brookline, Mass., assignor to Retina Foundation, Boston, Mass.

Continuation-in-part of Ser. No. 672,506, Mar. 26, 1976, abandoned, which is a continuation-in-part of Ser. No. 292,150, Sep. 25, 1972, which is a continuation-in-part of Ser. No. 536,879, Dec. 27, 1974, Pat. No. 3,954,329, which is a continuation-in-part of Ser. No. 292,150, , and Ser. No. 512,327, Oct. 4, 1974, Pat. No. 3,944,341. This application Jun. 20, 1977, Ser. No. 808,181

Int. Cl.[2] A61B *3/10*

U.S. Cl. 351—16 **38 Claims**



1. In a device for examining an eye fundus under applied illumination, said device having

lamp means for illuminating the fundus and

means for imaging the fundus through the lens of the eye and along an optical axis for viewing,

said lamp means directing light onto the sclera of the eye to illuminate the fundus,

the improvement comprising

optical image masking means for rendering the optical brightness of the image of the fundus more uniform as a function of location relative to the fundus than is the brightness of such illuminated light transmitted through the sclera onto the fundus.

36. A method for ophthalmic examination of an eye fundus under illumination applied at least in part through the eye sclera, said method comprising the improvement of optically masking the image of the eye fundus at the image region corresponding to the fundus location where the applied illumination enters through the sclera, for imparting a substantially uniform level of optical brightness to the fundus image including at the aforesaid region.

4,200,363

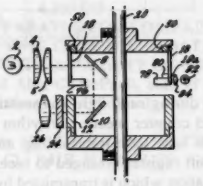
FILM PROJECTOR WITH SOUND PLAYBACK OR RECORDING

Robert A. Olodort, 536 N. Highland Ave., Los Angeles, Calif. 90036

Division of Ser. No. 873,146, Jan. 27, 1978, which is a continuation-in-part of Ser. No. 699,615, Jun. 25, 1976, abandoned. This application Dec. 11, 1978, Ser. No. 968,467

Int. Cl.[2] G03B *31/02*

U.S. Cl. 352—27 **19 Claims**



1. A motion picture projector for use with film having a row of perforations, comprising in combination:

sprocket wheel means rotatable about a central axis and engaging the perforations of the film to convey the film in a continuous motion along an arcuate path concentric with the central axis;

optical rectifying means connected to said sprocket wheel means for rotation therewith, and deviating the light through an angle sufficient at each instant to compensate for the angular diviation of the light caused by movement of the film;

stationary arcuate film guide means including a recess concentric with the central axis for supporting and guiding the film along said arcuate path; and,

sound reading means a portion of which is connected to said stationary arcuate film guide at a location radially inwardly of said recess.

4,200,364

MOTION PICTURE CAMERA

Kurt Borowski, Aschheim; Istvan Cocron, and Theodor Huber, both of Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,060

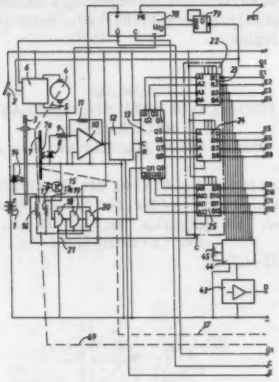
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734309

Int. Cl.[2] G03B *7/08*

U.S. Cl. 352—141 **14 Claims**

1. In a motion picture camera, the combination of an adjustable diaphragm; motor means operative to adjust the effective

size of the aperture which is defined by said diaphragm; a shutter mounted in front of said diaphragm for movement between light-transmitting and light-intercepting portions assumed during light-transmitting and light-intercepting phases of operation thereof, respectively; pulse generator means including frequency-determining photosensitive receiver means disposed behind said diaphragm so as to receive light which passes through said aperture during said light transmitting phase, said pulse generator means being arranged to emit pulses whose duration is less than that of any of said phases and the number of which is proportionate to the amount of scene light which passes through the diaphragm during said light-transmitting phase; binary counter means connected with said pulse generator means and operative for counting the number



of said pulses during each light-transmitting phase; means for activating said counter means in rhythm with movements of the shutter to said light-transmitting and light-intercepting positions; a shift register arranged to receive and advance the signal combination which is transmitted by said counter means at the completion of each activation of said counter means, said shift register having outputs for said signal combination; a first signal source operative to transmit a fixed reference signal combination; a digital comparator having first terminals connected with the outputs of said shift register and second terminals; a second signal source operative to transmit a variable second reference signal combination; and means for connecting said second terminals with one of said sources at a time, said comparator having output means operatively connected with said motor means.

4,200,365

DISPLAY AND REPRODUCTION OF COLOR

Hagop Keondjian, London, and Stanley W. Bugbee, Watford, both of England, assignors to H. K. Productions Limited, London, England

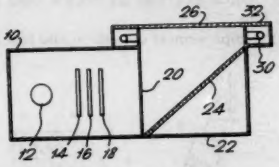
Filed Jul. 12, 1978, Ser. No. 924,097

Claims priority, application United Kingdom, Jul. 13, 1977, 29468/77

Int. Cl.[2] G03B *21/26, 21/14*

U.S. Cl. 353—29 **15 Claims**

1. Color display apparatus comprising first light producing means to produce light of variable color, second light producing means to produce light of a predetermined reference color, first and second screens to display light from said first and second light producing means respectively, said second screen providing a border to said first screen, means selectively to vary the color of the light produced by said first light producing means, and means to provide a representation of the intensity of component colors of the light produced by said first



light producing means, whereby the color of the light produced by said first light producing means is uniquely defined.

4,200,366

MICROFORM READERS

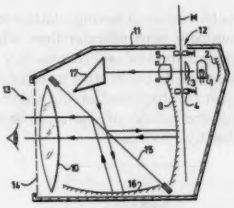
Michael H. Freeman, Denbigh, Wales, assignor to Pilkington P. E. Limited, St. Helens, England

Filed Oct. 28, 1977, Ser. No. 846,314

Claims priority, application United Kingdom, Nov. 5, 1976, 46060/76

Int. Cl.[2] G03B *21/28*

U.S. Cl. 353—78 **18 Claims**



1. A portable microform reader, comprising means for supporting microform material, a light source positioned to pass light through microform material so supported, a projection lens to project an image of the microform material on to a screen, a biocular magnifier lens through which an observer can view a magnified version of said image, and a partial reflector located in the light paths between the projection lens and the screen and between the screen and the biocular magnifier lens so that light travels from the projection lens to the screen via said partial reflector, and from the screen to the biocular magnifier lens via said partial reflector.

4,200,367

PROJECTOR

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 1, 1978, Ser. No. 901,604

Int. Cl.[2] G03B *21/10, 21/20*

U.S. Cl. 353—78 **5 Claims**

1. A projector comprising:

a first housing for substantially enclosing means for transmitting an image in a film unit onto a rear projection screen, said first housing including a section through which the light from a projection bulb may enter said first housing;

a rear projection screen mounted in one wall of said first housing;

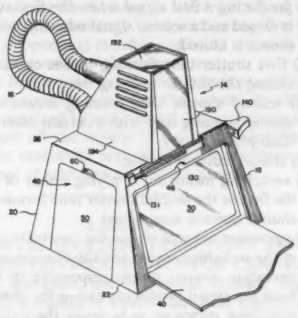
means mounted within said first housing for transmitting an image onto said rear projection screen, said transmitting means defining an optical path in which said section of said first housing is in alignment with;

means for supporting a film unit containing a plurality of

discrete visible images such that only one of the discrete images is located in alignment with said optical path;

a second housing having an open end, said second housing including means for supporting a projection bulb in position to direct a substantial portion of its illumination through said open end;

means for universally coupling said second housing to said first housing, said coupling means being manually adjustable so as to locate the entire surface defining said open end of said second housing in spaced relation to said first housing and in juxtaposed relation to said section of said first housing, whereby when a projection bulb is mounted



in said means for supporting a projection bulb, the illumination from the projection bulb may be used for reading when said open end of said second housing is located in spaced relation to said section of said first housing and may be used to project one of the discrete images in the film unit along said optical path and onto said rear projection screen when said open end of said second housing is located in juxtaposed relation to said section of said first housing; and

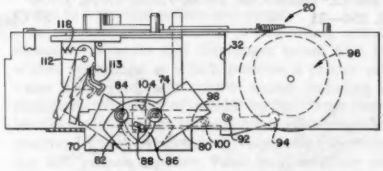
means for positioning the film unit relative to said supporting means so as to locate another of the discrete images in the film unit in alignment with said optical path.

4,200,368

SLIDE PRESENCE SHUTTER LOCK

Keith J. Houseknecht, Vestal, N.Y., assignor to The Singer Company, New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,407
Int. Cl.[2] G03B *23/00*
U.S. Cl. 353—88 **11 Claims**



1. An apparatus for projecting slides comprising:

a frame, said frame formed with an aperture therethrough coaxial with the optical path of said apparatus;

a gate formed in said frame co-axial with said aperture, said gate including stationary guide means for receiving slides;

a shutter adjacent said gate, said shutter having a first position blocking the optical path of said apparatus and a second position for which the optical path of said apparatus is not blocked;

shutter control means for moving said shutter between said first and said second positions; and

means for sensing the absence of a slide in said gate, said sensing means including feeler means for detecting the width of a slide placed within said gate, latch means for selectively engaging said shutter control means and arresting the movement thereof when said shutter is in said first position and means for cross-relating said feeler means with said latch means whereby when said feeler means detects the absence of a slide in said slide gate, said latch means engages said shutter control means, and, conversely, when said feeler means senses the presence of a slide in said slide gate, said latching means is disengaged from said shutter control means;

said cross-relating means comprises said feeler means and said latching means being parts of a member, said member being pivotally mounted in said frame;

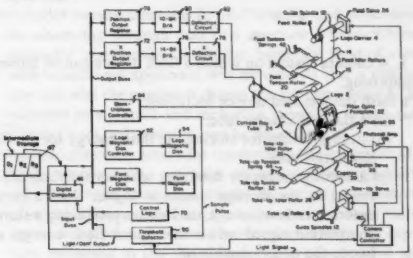
said guide means being formed with an aperture therethrough for allowing said feeler means to enter said gate.

4,200,369

METHOD AND APPARATUS FOR COMPACTING AND DECOMPACTING CHARACTER DATA IN ACCORDANCE WITH A VARIETY OF METHODS

John S. Richards, and Alan G. DePaoli, both of Bolingbrook, Ill., assignors to Information National, Inc., Culver City, Calif.

Filed May 23, 1978, Ser. No. 908,772
Int. Cl.[2] B41B *19/04, 21/30*
U.S. Cl. 354—7 **27 Claims**



1. In phototypesetting apparatus including scanning means for scanning a light spot in a defined pattern across a character having light transmissive and non-transmissive portions, light sensitive means responsive to the light spot, means for sensing and for providing signals indicative of transitions of the light spot between the non-transmissive and transmissive portions of said character, and means for storing the signals, the combination of:

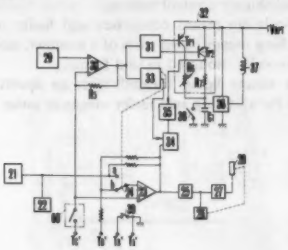
means responsive to the number and spacing of the character transitions for selecting one of a plurality of methods of compacting the signals to be stored in said storing means dependent upon which method will produce the smallest quantity of storable transition data, and

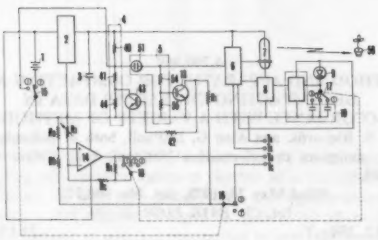
means for compacting the signals from said storing means in accordance with the selected compacted method and storing the compacted data into said storing means.

4,200,370
CAMERA FOR DAYLIGHT AND FLASH PHOTOGRAPHY

Hiroshi Aizawa, Kawasaki; Masanori Uchidoi, Yokohama; Zenzo Nakamura, Urawa, and Yoshiyuki Takishima, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 789,224, Apr. 20, 1977, abandoned.
This application Oct. 13, 1978, Ser. No. 951,083
Claims priority, application Japan, Apr. 22, 1976, 51/45785; Jun. 23, 1976, 51/74029; Sep. 9, 1976, 51/108306; Dec. 28, 1976, 51/159314
Int. Cl.² G03B 7/16
U.S. Cl. 354—33 **5 Claims**





1. A camera system on which a flash device can be mounted comprising:

a flash device, said device including:

(a) a flash discharge tube;

(b) storage means for storing the flash energy for the flash discharge tube;

(c) detecting means for detecting whether the flash energy stored in the storage means is higher than a certain determined level or not, said means producing a storage completion signal when the stored flash energy surpasses the determined level;

(d) holding means for the photographing mode, said means including a first switching means to be closed when no storage completion signal is produced and a second switching means to be closed when the storage completion signal is produced, whereby the second switching means which has been closed holds the first switching means in the switched-off state while the first switching means which has been closed prevents the detecting means from producing the storage completion signal so as to hold the second switching means in the switched-off state; and

(e) flash aperture information forming means for forming aperture information corresponding to a certain determined aperture value for flash photography;

a camera body, said body including:

(a) information input means, said means producing an electrical signal corresponding to the brightness of the object to be photographed;

(b) calculating means;

(c) change-over means capable of being changed over between a first position at which the output signal of the information input means is applied to the calculating means and a second position at which the output signal of the flash aperture information signal forming means is applied to the calculating means;

(d) aperture control means for controlling the aperture in accordance with the output of the calculating means;

(e) signal producing means for applying a signal to the photographic mode holding means in accordance with the release operation of the camera, said means applying the signal to the photographic mode holding means for producing a first signal when the first switching means is closed and a second signal when the second switching means is closed;

(f) first shutter time forming means capable of manually setting the shutter opening time;

(g) second shutter time forming means for setting the shutter opening time with a certain determined time for flash photography;

(h) shutter control means;

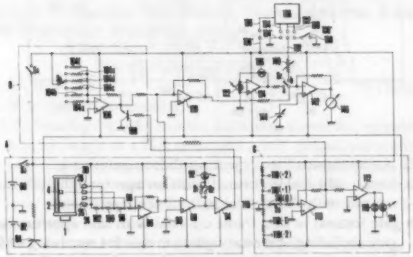
(i) switching means for applying either of the outputs of the first or the second shutter time forming means to the shutter control means; and

(j) operation control means for controlling the operation of the switching means and the change-over means, said operation control means responsive to the first signal from the signal producing means for changing over the switching means so as to apply the output of the first shutter time control means to the shutter control means and, at the same time, changing over the change-over means to the first position, while said operation control means, responsive to the second signal from the signal producing means, changing over the switching means so as to apply the output of the second shutter time control means to the shutter control means and, at the same time, changing over the change-over means to the second position.

4,200,371
PHOTOGRAPHIC CAMERA WITH FILM SPEED SETTING SYSTEM

Ryoichi Suzuki; Tetsuya Taguchi, both of Kawasaki; Toyotosi Suzuki, Tokyo; Noriaki Sanada, Yokohama; Nobuo Tezuka, Tokyo, and Takashi Uchiyama, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,469
Claims priority, application Japan, Oct. 15, 1976, 51-123598; Oct. 21, 1976, 51-126516; Oct. 21, 1976, 51-126517; Oct. 21, 1976, 51-126518; Nov. 4, 1976, 51-132612; Nov. 5, 1976, 51-132822
Int. Cl.² G03B 7/08, 17/36, 15/03, 17/18, 17/38
U.S. Cl. 354—21 **37 Claims**



11. An automatic film sensitivity setting system for a camera having a control circuit which performs exposure control

according to information related to the brightness of an object to be photographed, said system comprising:

(a) an automatic film sensitivity setting circuit including:

(1) film sensitivity signal sensing means having a plurality of sensing terminals arranged to contact with a signal part of a film container and constituting contact means, the contact operation of which is controlled by the signal part of the film container; and

(2) first converting means for producing an electrical signal corresponding to the sensitivity of film for automatic setting, the first converting means being arranged to produce film sensitivity information corresponding to each of said contact means;

(b) manual film sensitivity setting means having second converting means for forming an electrical signal representative of a film sensitivity value and arranged to cooperate with an operating member and being manually operable from the outside of the camera; and

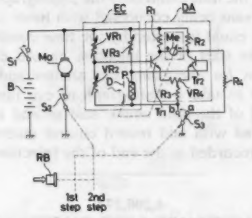
(c) automatic film sensitivity selecting means provided with cut-off means which automatic film sensitivity selecting means is connected to said manual film sensitivity setting means to cut off the supply of the output signal of said manual film sensitivity setting means in response to the output signal of said first converting means.

4,200,372

AUTOMATIC APERTURE PRESETTING AND EXPOSURE CONTROL DEVICE FOR CAMERA

Hideto Iwama, Kawasaki, and Masamichi Toyama, Machida, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 24, 1978, Ser. No. 899,339
Claims priority, application Japan, Apr. 28, 1977, 52-49473
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—43 **16 Claims**



1. For a camera having release means, an automatic exposure control system comprising:

(A) a diaphragm means having a range of operating positions;

(B) a driving means for driving and setting said diaphragm means to a position within said range;

(C) an exposure control means of controlling said driving means so as to set said diaphragm means to a position within said range at which position a proper exposure value is attained, said control means including a light measuring element illuminatable by light from a scene and electrical elements for entering other exposure factors and electrically coupled to said driving means, and determining said proper exposure value in accordance with the output of said light measuring element and other exposure factors entered in said electrical elements;

(D) a diaphragm presetting means for controlling said driving means so as to set said diaphragm means to a predetermined intermediate position in said range, said presetting means being electrically coupled with said driving means and electrically operable independently of said exposure control means; and

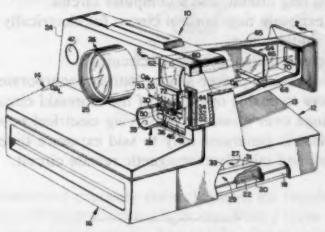
(E) a change-over means for selecting one of said diaphragm presetting means and said exposure control means, said change-over means being operatively associated with said camera release means so as to make said exposure control means inoperative and said presetting means operative when the release means is not actuated and to make said presetting means inoperative and said exposure control means operative when the release means is actuated.

4,200,373

PHOTOGRAPHIC CAMERA APPARATUS FOR VISUALLY INDICATING THE STATUS OF AN EXPOSURE TRIM MECHANISM

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 31, 1978, Ser. No. 929,840
Int. Cl.[2] G03B *17/20*
U.S. Cl. 354—53 **8 Claims**



1. Photographic camera apparatus for use in a camera of the automatic type which is adapted to use film having a given speed, said apparatus comprising:

a housing having at least a first and a second light-admitting aperture;

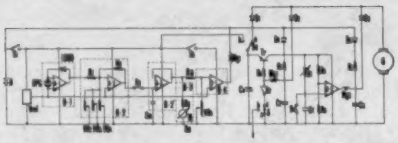
viewfinder means mounted in said housing and structured for observing through said first aperture a field-of-view generally coextensive with the camera's field-of-view with which said apparatus will be used so that a camera user can aim the camera to frame the subject matter to be included in a picture and including means by which said housing's second aperture can be observed;

automatic exposure means for controlling the exposure of a film, said automatic exposure means including manually adjustable trim means for selectively varying the control of said automatic exposure means, said trim means being movable between a nominal position at which the exposure delivered to the film is a predetermined value and other positions at which the exposure delivered to the film differs from said predetermined value by predetermined amounts, greater or less than said predetermined value, which depend on the position of said trim means, said trim means including means for blocking said second aperture when said trim means is located in its nominal position and for unblocking said second aperture when said trim means is in a position other than its nominal position to provide to a user of the camera a visual indication in said viewfinder means that said trim means is positioned at one of its positions other than its said nominal position so that the user of the camera, while framing the subject matter to be photographed, can at his discretion adjust said trim means for an exposure that will produce a picture which will be either lighter or darker than the one that would be produced if said trim means remained unchanged or can place said trim means in its said nominal position.

4,200,374
CAMERAS HAVING A COORDINATED ENERGY SUPPLY SYSTEM FOR SHUTTER RELEASE

Masami Shimizu, Tokyo; Masanori Uchidoi, Yokohama; Nobuaki Date, and Hiroshi Aizawa, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1978, Ser. No. 935,878
Claims priority, application Japan, Aug. 31, 1977, 52-105185
Int. Cl.[2] G03B 7/00
U.S. Cl. 354—60 R 3 Claims

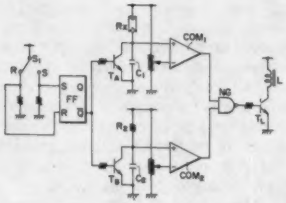


1. A camera having an automatic exposure control apparatus, comprising:
(a) an automatic exposure control circuit including a light measuring circuit, and a computer circuit;
(b) an exposure time control circuit for electrically controlling shutter time;
(c) an electromagnetic release circuit;
(d) an electrical power source battery incorporated in the camera to enable operation of the aforesaid circuits; and
(e) change over means for supplying electrical power from an electric generator only to said exposure time control circuit and said electromagnetic release circuit.

4,200,375
EXPOSURE CONTROLLING CIRCUIT FOR ELECTRIC SHUTTER

Yasuo Ishiguro; Kenji Wakazono, and Toshihisa Saito, all of Tokyo, Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Oct. 13, 1978, Ser. No. 951,453
Claims priority, application Japan, Oct. 19, 1977, 52/140288[U]
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—50 2 Claims

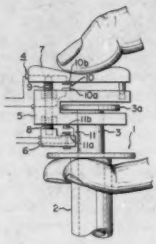


1. An exposure controlling circuit for electric shutters comprising a first time circuit which can determine a proper exposure time in response to the brightness of an object to be photographed, and a second time circuit which is connected with said first time circuit and can determine the shortest exposure time, said first and second time circuits being arranged so as to be able to start their operations simultaneously as associated with the opening of the shutter and being arranged so that the shutter can only be closed when both states of said first and second time circuits reverse.

4,200,376
FLUORESCENT OPHTHALMOSCOPIC PHOTOGRAPHING APPARATUS

Masaya Takeuchi, Iwaki, Japan, and Phillip H. Hendrickson, Basel, Switzerland, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Filed Jul. 25, 1978, Ser. No. 927,799
Claims priority, application Japan, Jul. 25, 1977, 52-89067
Int. Cl.[2] G03B 29/00
U.S. Cl. 354—62 4 Claims

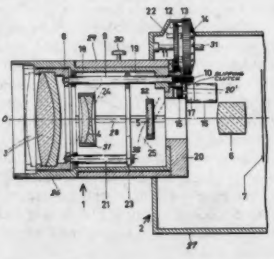


1. Fluorescent ophthalmoscopic photographing apparatus comprising photographing means for taking a photograph of eye fundus on a photographing film, shutter means for the photographing means, illumination means for illuminating a patient's eye, shutter and illumination control means for controlling actuation of the shutter and illumination means to take said photograph, fluorescent agent injection means, first switch means adapted to be actuated in response to the start of the injection, second switch means adapted to be actuated in response to the end of the injection, time counting means, means for projecting the time count onto the photographing film, said first switch means being connected with timer control means so that a time count is started by the time counting means in response to the start of the injection, record control means includes means for energizing said shutter and illumination control means to take a photograph of eye fundus together with a record of the time count, said second switch means being connected with said record control means so that the time count is recorded at the end of the injection.

4,200,377
FOCUSING MECHANISM FOR CAMERA OBJECTIVE

Karl H. Holderbaum, Bad Kreuznach, Fed. Rep. of Germany, assignor to Jos. Schneider & Co., Optische Werke Kreuznach, Bad Kreuznach, Fed. Rep. of Germany

Filed Apr. 6, 1978, Ser. No. 894,031
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715646
Int. Cl.[2] G02B 15/14; G03B 3/00
U.S. Cl. 354—195 6 Claims



1. In a camera provided with a housing and an objective

projecting forwardly from said housing, said objective including a lens barrel centered on an optical axis and a plurality of lenses in said lens barrel, at least one of said lenses being provided with an axially shiftable lens mount,

the combination therewith of:

stationary bearing means in said lens barrel;

a guide rod slidably and nonrotatably held in said bearing means, said guide rod being fastened to said lens mount and extending rearwardly therefrom parallel to said optical axis while terminating in a threaded rear extremity within said housing;

a rotatable captive drive nut matingly engaging said extremity, said nut being provided with external gear teeth and being held against axial displacement in said housing;

focusing means for rotating said nut to shift said lens mount along with said lenses, said focusing means including a setting wheel on an ancillary shaft parallel to said optical axis, said setting wheel projecting from said housing for manual rotation; and

a spur gear on said ancillary shaft rigid with said setting wheel and in mesh with the gear teeth of said nut.

4,200,378

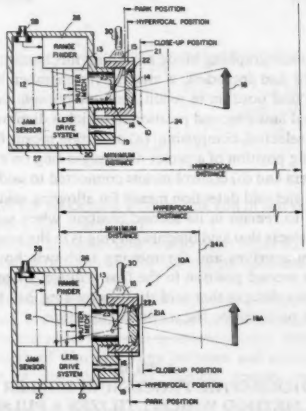
AUTOMATIC FOCUSING CAMERA WITH LENS JAM SENSOR CONTROL

Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 729,289, Oct. 4, 1976, abandoned. This application Apr. 25, 1978, Ser. No. 899,871

Int. Cl.[2] G03B *3/00*

U.S. Cl. 354—195 **7 Claims**



1. An automatic focusing camera having a housing containing a focal plane defining a recording station located behind a shutter mechanism, means for initiating a camera cycle, a lens mount movable on the camera for focusing an image of a subject on the focal plane, a range finder system for generating a range parameter related to subject distance, the range finder system including a pulse generator responsive to the lens movement for generating a pulse train, drive means operable when energized to move the lens mount toward a focus position selected in accordance with the parameter, the improvement comprising:

a jam sensor for producing a jam signal if the lens mount does not move to the selected focus position in response to operation of the drive means, the jam sensor including a jam counter that counts at a predetermined rate and is cleared at a rate directly related to the pulse train, and a jam counter decoder responsive to sensing a predetermined count in the jam counter for producing the jam signal whereby the jam sensor produces the jam signal when the drive means is enabled and the lens mount fails to move; and

means responsive to the jam signal for disabling the drive means.

4,200,379

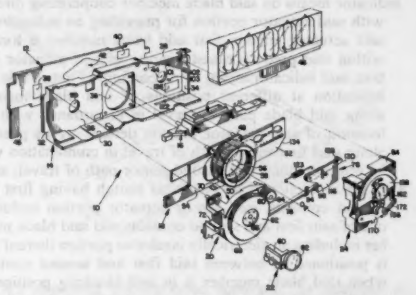
EXPOSURE CONTROL SYSTEM INCLUDING BLADE SENSING FOLLOW FOCUS AND TRIM ARRANGEMENT

Irving Erlichman, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 1, 1978, Ser. No. 930,029

Int. Cl.[2] G03B *3/00, 7/14, 9/02*

U.S. Cl. 354—196 **9 Claims**



1. An improved exposure control system for regulating the transmission of image-carrying light rays from a scene along an optical path to a photographic film unit located at a given focal plane, said exposure control system being of the type including at least one blade member; means for mounting said blade member for displacement along a given blade path of travel between first and second positions, said blade member being configured to block the optical path when located in its said first position and unblock the optical path when located in its said second position and to provide progressively changing aperture values within a given range of aperture values through which scene light may pass to the given focal plane as said blade member is displaced from said first position, each of said aperture values being in correspondence with a respective position of said blade member along said blade path of travel; sensor means for determining when said blade means has reached a predetermined position along said blade path of travel; said sensor means including a sensor having an actuator portion and providing a given output signal when said blade member is displaced from said first position to within a predetermined vicinity of said actuator portion; means for mounting at least said actuator portion for displacement along a first sensor path of travel at least substantially parallel to said blade path of travel; aperture selecting means for selecting an aperture value in correspondence with the distance to the scene to be photographed and for displacing at least said actuator portion to a predetermined location along said first sensor path of travel in accordance with said selected aperture value; drive means being operative for displacing said blade member between its said first and second positions; and actuating means for activating said drive means to displace said blade member from its first position toward its second position to initiate an exposure interval during which scene light is directed to the given focal plane and for then at least temporarily terminating further activation of said drive means so as to interrupt said displacement of said blade member in response to said given output signal provided by said sensor to thereby select an aperture value in operative relation to the optical path in accordance with the location of said actuator portion along said first path of travel of said sensor wherein the improvement comprises:

means for mounting at least said actuator portion of said sensor for displacement along a second sensor path of travel intersecting said first sensor path of travel and being disposed in substantially transverse relation thereto so that said actuator portion may be displaced along either one of said first or second sensor paths independently of its displacement along the other of said first and second sensor paths;

aperture trim means being operative independently of the operation of said aperture selecting means for displacing said actuator portion along said second path of travel to move said actuator portion from said predetermined location along said first sensor path of travel to make adjustment in the aperture value set by operation of said aperture selecting means;

indicator means on said blade member cooperating directly with said actuator portion for providing an indication to said actuator portion that said blade member is located within said predetermined vicinity of said actuator portion, said indicator means being configured to provide said indication at different positions of said blade member along said blade path of travel in accordance with the location of said actuator portion defined by its position along said first sensor path of travel in combination with its position along said second sensor path of travel; and

said sensor including an electrical switch having first and second contacts, said sensor actuator portion including one of said first and second contacts and said blade member including an electrically insulative portion thereof that is positioned in between said first and second contacts when said blade member is in said blocking position to maintain said switch in its nonconducting state and said insulative portion of said blade member being removed from its insulating position in response to displacement of said blade member from its blocking position toward its unblocking position thereby allowing engagement of said first and second contacts to causing said switch to assume its conducting state and provide said given output signal to said actuating means.

4,200,380

CAMERA PROVIDED WITH MEANS FOR GIVING INFORMATION ABOUT PHOTOGRAPHING

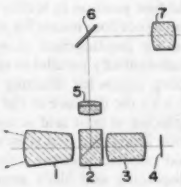
Yasuhisa Sato, Kawasaki; Sadahiko Tsuji; Kazuo Ishikawa, both of Yokohama, and Susumu Matsumura, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,906

Claims priority, application Japan, Oct. 6, 1977, 52-120417

Int. Cl.[2] G02B *5/32*; G03B *13/02*

U.S. Cl. 354—219 **7 Claims**



1. A camera having a holographic indicator for displaying information relating to a picture taking operation to a person who is the object to be photographed, comprising:

an objective lens for imaging an object on an image detecting means;

a shutter and diaphragm means for controlling exposure;

finder means having an image forming optical means for forming an image of said object on an image forming plane;

a hologram; and

an illuminating optical means which illuminates said hologram to obtain a reconstructed image positioned in the optical path of the object image forming light so that light from said holographically reconstructed image travels in the opposite direction to that of said object image forming light and is emitted toward said object through said objective lens such that the person to be photographed is able to observe it;

whereby the image formed by the finder means is not obstructed by the formation of said reconstructed image.

4,200,381

PHOTOGRAPHING MODE SWITCHING MECHANISM IN CAMERA

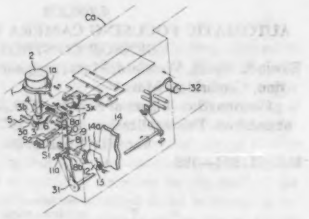
Sunao Ishizaka, and Yoshitaka Araki, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 16, 1979, Ser. No. 21,225

Claims priority, application Japan, Mar. 22, 1978, 53-35499[U]

Int. Cl.[2] G03B *17/00*

U.S. Cl. 354—289 **6 Claims**



1. A photographing mode switching mechanism adapted for a camera and including a switchover member movable between a first position in whch a non-diaphragm control mode is selected and a second position in which a diaphragm control mode is selected, comprising: (a) detection means for detecting the setting position of a preset diaphragm ring on a lens tube of the camera and (b) control means connected to said switchover member and said detection means for allowing said switchover member to remain in its second position when said detection means detects that said diaphragm ring is in the position for the minimum aperture and for moving said switchover member from the second position to the first position when said detection means detects that said diaphragm ring has been moved from the position for the minimum aperture.

4,200,382

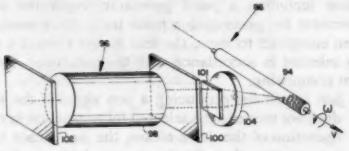
PHOTOGRAPHIC PROCESSING ROLLER AND A NOVEL METHOD WHICH UTILIZES A PULSED LASER FOR MANUFACTURING THE ROLLER

Harvey S. Friedman, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1978, Ser. No. 938,092

Int. Cl.[2] G03D *9/02*

U.S. Cl. 354—304 **14 Claims**



1. In an improved cylindrical processing roller for use in a motor driven photographic processing apparatus of the type

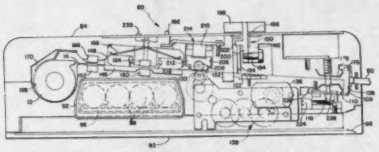
for advancing an integral type self-processable film unit to the exterior of a camera while simultaneously spreading a fluid processing composition between selected layers of the film unit and of the type having a circumferential surface of given length machined to a precision diameter to facilitate spreading the fluid processing composition in a substantially uniform thin layer between the film unit's selected layers, the improvement comprising a plurality of generally uniformly spaced apart, substantially uniform sized and shaped microscopic craters each of which is formed along a predetermined length of said surface by locally melting said surface with a low energy laser pulse, said craters covering a predetermined percentage of the area of said predetermined surface and each being surrounded by a substantially uniform generally annular lip which extends above said surface by an amount insufficient to mark the film unit's surface, said roller surface being thus configured to provide said roller with a high-friction characteristic for transporting a film unit while being insufficiently rough to leave any visually perceptible marks on a film unit surface, to minimize pickup of particulate matter from the film unit which would otherwise build up and reduce said high-friction characteristic, and to maintain the effectiveness of said roller's precision diameter so that substantially no change in its fluid spreading performance results from the presence of said craters.

4,200,383

TRANSPARENCY FILM PROCESSOR

Leonard V. Bendoni, Framingham, Mass., and Richard V. Fischer, West Warwick, R.I., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 15, 1978, Ser. No. 969,996
Int. Cl.[2] G03D *9/02*
U.S. Cl. 354—304 **6 Claims**



1. Apparatus for processing a composite roll of self-developing transparency film comprising:

first and second housings coupled to each other for movement between a film cassette loading position and a film processing position;

means within said first housing for supporting a film cassette containing a composite roll of self-developing transparency film including first and second opposite ends and a given length of film extending between and containing a plurality of discrete, latent, subject images recorded thereon;

a lighttight chamber connectable with said first and second housings for receiving the second end of the film;

a pair of elongate rollers adapted to be located on opposite sides of the film when said first and second housings are in said film processing position;

a motor;

drive means coupled to said motor and to one of said rollers to thereby enable said motor, when energized, to rotate said one roller so as to advance the film from the film cassette and into the lighttight chamber while simultaneously spreading a processing liquid across the given length of the film to initiate the transformation of the discrete latent images into visible images;

means for automatically disconnecting said motor from its source of energy when a container of processing liquid is not located within said apparatus in position to be spread across the transparency film by said rollers; and

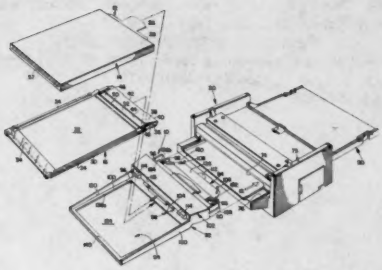
means for automatically disconnecting said motor from its source of energy after the end of the given length of film located closest to the first end of the film has moved through said rollers.

4,200,384

PHOTOGRAPHIC APPARATUS FOR COUPLING TOGETHER ELEMENTS OF A SELF-DEVELOPING FILM UNIT

Donald G. Josephson, Wilmington, and Duncan C. Sorli, Chelmsford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 2, 1979, Ser. No. 15
Int. Cl.[2] G03D *5/02*
U.S. Cl. 354—304 **17 Claims**



1. An improved photographic apparatus for coupling together sheet elements of a self-developing film unit, including a photosensitive image-recording film sheet provided in a cassette and an image-receiving print sheet, and for facilitating the presentation of the coupled film and print sheets to a sheet receiving entry of a self-developing film unit processor, the film sheet being of the type including a film leader, at its forward end, having a forwardly projecting coupling tab thereon, the print sheet being of the type having a print leader, at its forward end, including a print leader flap folded back on the print leader along a forward fold line and terminating rearwardly in an unsecured tailing edge portion and having a tab slot near the fold line for receiving the coupling tab therethrough to bring the film and print sheets into coupled registered relation, the print sheet also being of the type including a rupturable container of processing fluid having leading and trailing edge seals and being longer between these seals than the flap, the container being positioned under the flap with its forward portion, adjacent the leading edge seal, secured to the print leader near the fold line and its trailing end portion unsecured and extending rearwardly on the print leader beyond the trailing edge portion of the flap so that the flap is in proximity to an upper surface of the container whereby the flap and upper surface of the container cooperate to form a tab guide passageway of a minimum dimension therebetween leading to the slot, said apparatus being of the type including a body, means for attaching the body to the processor in an operative position adjacent the entry of the processor, a tray for receiving and supporting a print sheet in general alignment with the entry of the processor, means for engaging the forward edge of the print sheet in the tray to releasably restrain forward movement of the print sheet toward the entry until the print and film sheets are coupled together, cassette seating means for receiving and positioning the cassette at a fully inserted position in general registration with the print sheet in the tray with the tab projecting from a forward end of the cassette and facing the processor entry, and tab guiding means for guiding the film tab through the passageway and tab receiving slot, to effect sheet coupling, and into the processor entry as the cassette approaches its fully inserted position in the cassette seating means wherein the improvement comprises:

means for displacing the print leader flap away from the upper surface of the container of a print sheet in the tray a distance greater than the distance the flap was initially

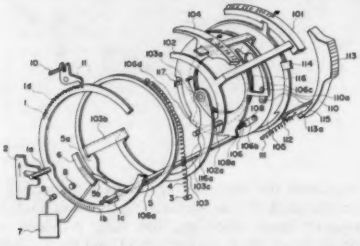
spaced from the upper surface of the container, to define the tab guide passageway of minimum dimension, prior to the insertion of the tab on a film sheet into said passageway to increase the dimension of said passageway in a direction generally transverse to the path of travel of the tab therethrough for facilitating the insertion of the tab into said passageway and through the slot.

4,200,385

LENS SHUTTER USE AND NON-USE SWITCHING DEVICE OF AN INTERCHANGEABLE LENS HAVING A LENS SHUTTER FOR USE WITH A FOCAL PLANE SINGLE LENS REFLEX CAMERA

Tetsuji Shono, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 6, 1978, Ser. No. 922,472
Claims priority, application Japan, Jul. 6, 1977, 52-80570
Int. Cl.[2] G03B *9/58*
U.S. Cl. 354—233 **11 Claims**



1. A lens shutter use and non-use switching device of an interchangeable lens having a lens shutter for use with a focal plane shutter single lens reflex camera, the improvement comprising:

(a) use means sensing a non-use setting and a plurality of lens shutter speed settings for providing a first movement indicating use of said lens shutter and a second movement indicating non-use of said lens shutter;

(b) switch means responsive to said first movement of said use means for generating a use electrical control signal and responsive to said second movement of said use means for generating a non-use electrical control signal;

(c) aperture ring means sensing an automatic setting and a plurality of manual F-stop settings for providing an automatic setting movement indicating automatic aperture control and a plurality of manual F-stop setting movements indicating manual F-stop settings;

(d) lens shutter means disposed in the optical axis of said interchangeable lens for providing a shutter operation, said lens shutter means normally in the sector open state, said lens shutter means going to the sector closed state on command of a sector closing movement and providing a shutter action of a selected time duration on command of a release movement, said selected time duration being determined by said plurality of lens shutter speed settings when said use means senses use of said lens shutter;

(e) aperture means disposed in said optical axis for providing aperture operation in accordance with said plurality of manual F-stop settings when said aperture ring means is in said manual F-stop setting range;

(f) control means responsive to said use and non-use electrical control signals from said switch means and responsive to the depression of a release button, for maintaining said lens shutter means in said normal sector open state when said non-use electrical control signal is sensed, and when said use electrical control signal is sensed, for providing a sector closing movement to cause said lens shutter means to go to the sector closed state after the depression of said release button, for causing said focal plane shutter to be changed from said fully closed state to the fully open state after said sector closing movement has been completed, for providing a release movement to said lens shutter means after said focal plane shutter has reached said fully open state, and for causing said focal plane shutter to be changed to the fully closed state after said shutter action of said lens shutter means has been completed; and

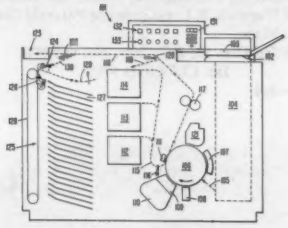
automatic aperture control means responsive to an automatic aperture control signal for controlling the aperture opening of said aperture means, and further comprising an electronic eye means for providing an automatic control signal to said automatic aperture control means when said automatic setting movement from said aperture ring means is sensed, and wherein said control means allows said aperture opening to be set by said automatic aperture control means subsequent to the sensing of said use electrical control signal and said release button depression and prior to providing said sector closing movement.

4,200,386

COPIER/COLLATOR WITH EXTENDED COLLATE FUNCTIONS

Carl A. Queener, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,168
Int. Cl.[2] G03G *15/00*; B65H *29/58*
U.S. Cl. 355—14 SH **7 Claims**



1. A method of selectively operating a copier/collator installation to assemble more copy sets than can be accommodated in the collator, comprising the steps of:

enabling the copier to produce copies of originals,

producing a desired number of copies of an original set,

distributing copy sets into collator bins until their capacity is exceeded,

stacking the excess copy sets into a receptacle,

disabling production of copies by the copier,

removing copy sets from the collator bins, and

distributing copy sets into the collator bins from the receptacle by distributing means located within the copier/collator installation.

6. A combination, for copying sets of original document sheets and collating the copies into a number of copy sets, comprising:

a copier, including reproduction portions and sheet-handling portions, for receiving original document sheets, in sequence at an input and supplying to an output copies in the same sequence,

a container, connected to the copier output, for receiving copies,

a collator, having a number of bins, connected to the copier and the container, operable in a first mode to receive copies from the copier output and place them in sequentially selected bins to form one copy set in each bin, and operable in a second mode, to receive copies from the container and place them in sequentially selected bins to form one copy set in each bin,

first control means, connected to said copier, container and collator, for directing copies to the container instead of to

the collator, when the number of copy sets reproduced exceeds the number of bins in the collator, and

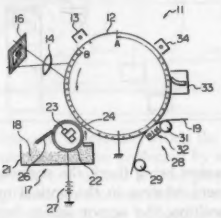
second control means, connected to said copier, container and collator, for directing copies from the container to sequentially selected collator bins to form one copy set in each bin.

4,200,387

IMAGE REVERSAL ELECTROSTATOGRAPHIC APPARATUS

Masao Masumura, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,535
Claims priority, application Japan, Jul. 29, 1977, 52-91158
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 DD **1 Claim**



1. An electrostatographic apparatus including a photoconductive member, charging means for applying an electrostatic charge of a predetermined polarity to the photoconductive member and imaging means for radiating a light image onto the photoconductive member to form an electrostatic image, characterized by comprising developing means for applying a toner substance to the photoconductive member to develop the electrostatic image into a toner image, the toner substance being electrostatically charged with the same polarity as the photoconductive member and adhering to areas of the electrostatic image having low electrostatic charge;

the developing means comprising biasing means for urging the toner substance against the photoconductive member;

the biasing means comprising electric field producing means for producing an electric field having the same polarity as the photoconductive member for electrostatically repelling the toner substance against the photoconductive member;

the electric field being selected to be strong enough to cause the toner substance to adhere to the areas of the electrostatic image having low electrostatic charge but insufficiently strong to cause the toner substance to adhere to areas of the electrostatic image having high electrostatic charge;

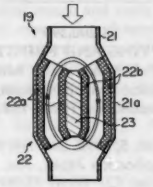
the imaging means radiating the light image only onto an image area of the photoconductive member, the photoconductive member also being provided with a non-image area, the charging means charging the entire photoconductive member, the electric field being insufficiently strong to cause the toner substance to adhere to the non-image area.

4,200,388

TONER DENSITY SENSOR FOR ELECTROSTATIC COPYING MACHINE

Mitsuo Hasebe; Mutsuo Watanabe; Kunio Hibi, and Masayosi Watanuki, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1977, Ser. No. 851,904
Claims priority, application Japan, Dec. 8, 1976, 51-147272
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 DD **5 Claims**



1. A toner density sensor comprising:

a conduit through which a toner mixture of ferromagnetic carrier particles and non-magnetic toner particles is caused to flow; and

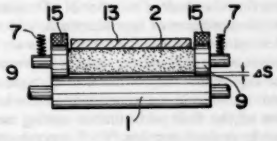
an electromagnetic coil disposed inside the conduit, said coil being constructed and arranged so that the magnetic lines of force of the coil are substantially confined within the conduit, the effective inductance of the coil varying in accordance with the toner density which is a ratio of toner particles to carrier particles in the toner mixture, said coil comprising two hollow, flattened coil sections which are symmetrically transversely disposed in the conduit, the axes of the coil sections being generally parallel to an axis of the conduit.

4,200,389

PRESSURE FIXING APPARATUS FOR COPIER

Toshio Matsui; Yasuhiko Doi, and Yasuo Nakamura, all of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Sakai, Japan

Filed May 12, 1978, Ser. No. 905,459
Claims priority, application Japan, Dec. 12, 1977, 52-160026
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 FU **6 Claims**



1. In a copying apparatus which includes a photoconductive member, a charging means for charging the surface of the photoconductive member, means for exposing the charged surface of the photoconductive member to a light image of an original so as to form an electrostatic latent image on the surface of the photoconductive member, means for developing the electrostatic latent image on the surface of the photoconductive member into the form of toner images on a copying paper, and a fixing means for fixing the toner images on copying paper by pressure

the improvement wherein said fixing means comprises a pair of rotatable metallic rollers forming a pressure nip therebetween through which the copying paper with toner images on one side passes, the metallic roller contacting the side of the copying paper on which the toner images

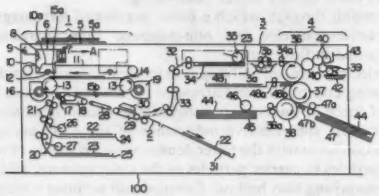
are located having a roughened surface of minute round-edged projections, said surface comprising a leveling layer of chromium covering a sub-surface of roughened projections formed by sand blasting the metallic roller surface with abrasive particles having sizes in the range of No. 120 to No. 400; wherein means are connected to said pair of rotatable metallic rollers to apply a pressure of between 20 and 60 Kg/cm therebetween; and wherein means are provided for maintaining a clearance between said rollers a distance less than the thickness of the copying paper passing therebetween.

4,200,390

COMBINED COPYING AND PRINTING APPARATUS

Satoshi Tagashira, Yokohama; Akira Motegi, Yokosuka, and Toshio Ishiguro, Yokohama, all of Japan, assignors to Hitachi Seiko Ltd. and Konishiriku Photo Ind., Co., Ltd., both of, Japan

Filed Jun. 5, 1978, Ser. No. 912,420
Claims priority, application Japan, Jun. 3, 1977, 52/64689
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 R **8 Claims**



1. A copying and printing apparatus including an integral combination of an electronic copying device and a printing device adapted to use a reproduction provided by said electronic copying device as a master sheet, comprising number setting means for setting a desired number N of reproductions, reference number n setting means for setting a reference number n of reproductions, control means including a comparator for controlling the reproducing operation for the desired number N of reproductions by said electronic copying device when said comparator detects that the desired number of copies N is equal to or smaller than the reference number n of reproductions, and for automatically controlling the initiaton of a printing operation utilizing the reproduction provided by said electronic copying device as the master sheet when said comparator detects that the desired number N of copies is larger than the reference number n of reproductions, and means for shifting the desired number N of reproductions set in said number setting means when said master sheet is forwarded to the printing device side under the conditon of $N > n$, and for storing the shifted number N or reproductions, wherein after the completion of the shift said number setting means can be set with a newly desired number N′ of reproductions and if the number N′ is equal to or smaller than the reference number n the copying operation by said electronic copying device can be independently conducted without regard to the conducting of the printing operation by said printing device.

4,200,391

ELECTROSTATOGRAPHIC APPARATUS COMPRISING DOCUMENT DENSITY SENSING MEANS

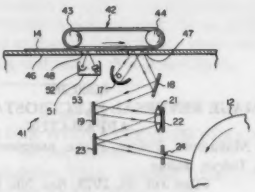
Koji Sakamoto; Susumu Tatsumi, and Chikara Imai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

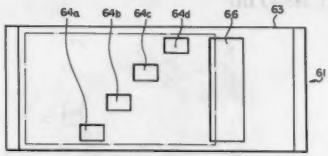
Filed Aug. 21, 1978, Ser. No. 935,121
Claims priority, application Japan, Aug. 26, 1977, 52-102310
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—14 E **4 Claims**

1. An electrostatographic apparatus including a moving photoconductive member, optical means for illuminating and focussing a light image of a portion of an original document onto the photoconductive member, scanning means for producing relative scanning movement between the document, optical means and photoconductive member and developing means for developing an electrostatic image on the photoconductive member to produce a toner image, characterized by comprising:

sensor means for sensing an optical density of the document prior to scanning movement; and

control means for controlling at least one of a light image intensity and a developing bias voltage in accordance with the sensed optical density;





the optical means being fixed, the scanning means moving the document relative to the optical means through an imaging position, the sensor means being disposed upstream of the imaging position in a direction of movement of the document;

the sensor means comprising a plurality of sensors spaced from each other perpendicular to the direction of movement of the document;

the sensors also being spaced from each other in the direction of movement of the document.

4,200,392

PHOTOGRAPHIC COPY APPARATUS WITH CROPPING FEATURE

Thomas A. Svatek, Carlisle, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

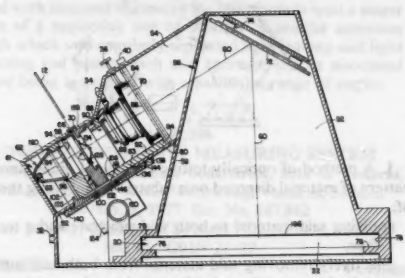
Filed Jan. 2, 1979, Ser. No. 13
Int. Cl.[2] G03B *13/28*
U.S. Cl. 355—45 **6 Claims**

1. An improved photographic copy apparatus, usable with an original picture to be copied and photosensitive imaging recording material that each have respective different first and second normalized image area formats, for previewing the original picture and selecting a portion thereof that is proportional to said first format of the recording material and thereafter projecting an image of the selected portion onto the recording material for exposure, said copy apparatus being of the type including means for locating image recording material of said first format in position for exposure, projecting means, including a lens having an optic axis, for projecting an image of the selected portion of the original picture of said second format onto the image recording material at said exposure position for exposure, means for controlling the exposure, a first picture holder for supporting the original picture in optical alignment with the lens axis, and a previewing station including a second picture holder for supporting an original picture for viewing

and selection of the portion to be copied wherein the improvement comprises:

means for mounting said first picture holder for movement transversely relatively to said lens axis so that said first picture holder may be located at a selected projection position wherein the selected portion of an original picture supported in said first picture holder is in optical alignment with said lens axis for image projection onto the image recording material at said exposure position;

means, cooperatively associated with said previewing station and said second picture holder thereat, for defining a portion selecting frame having a normalized format corresponding to said first format of said recording material and being proportioned in scale to the image area dimensions of the original picture so that when an original picture supported in said second holder, and said selecting frame are in optical superposition, the user may visually determine that portion of the picture within the bounds of said selecting frame that will be projected by said lens;



means for mounting one of said second picture holder and said selecting frame for movement relative to the other so that said selecting frame may be located with respect to any selected portion of the entire image area of a picture supported in said second picture holder; and

means for coupling said movably mounted one of said second picture holder and said selecting frame to said first picture holder such that said first picture holder is automatically moved, in response to movement of said movably mounted one of said second picture holder and said frame, to a corresponding selected projection position wherein it will locate for image projection the same selected portion of the original picture bounded by said selecting frame after the original picture is transferred from said second picture holder to said first picture holder.

4,200,393

METHOD OF POSITIONING A SEMICONDUCTOR MEMBER BY EXAMINING IT AND A DIE BONDING APPARATUS USING THE SAME

Etsuji Suzuki; Itaru Yasue, and Tomio Kashihama, all of Yokohama, Japan, assignors to Tokyo Shibaura Elecric Co., Ltd., Japan

Filed Jun. 7, 1977, Ser. No. 804,441

Claims priority, application Japan, Jun. 7, 1976, 51-65607; Jun. 7, 1976, 51-65608

Int. Cl.[2] G01N *21/32;* G01B *11/26*

U.S. Cl. 356—73 **14 Claims**

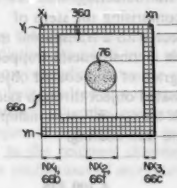
1. A method for positioning a semiconductor member by examining it, which examination is performed by focusing an optical image of the semiconductor member onto a photoelectric conversion face formed by arranging photoelectric conversion elements in rows and columns so as to take a matrix form, thereby to detect, by scanning both the distribution of first ones of said photoelectric conversion elements each producing an output signal when spotlighted by said optical image and the distribution of second ones of said photoelectric conversion elements each not producing an output signal when not spotlighted by said optical image, comprising:

(a) the step of setting a left reference column, right reference column, top reference row and bottom reference row on said photoelectric conversion face, thereby to determine, based on the detected distribution of the first and second ones of said photoelectric conversion elements, the number of columns in respective left and right column groups consisting respectively of columns consecutively arranged from said left and right reference columns, inclusive, toward said optical image and each having first ones of said photoelectric conversion elements of a number equal to or less than a specified value, and the number of rows in respective top and bottom row groups consisting respectively of rows consecutively arranged from said top and bottom reference rows, inclusive, toward said optical image and each having first ones of said photoelectric conversion elements of a number equal to or less than a specified value;

(b) the step of examining, using the number of rows and columns determined in step (a), whether or not an optical image of a semiconductor member is present on said photoelectric conversion face;

(c) the step of further examining, based on the detected distribution of the first and second ones of said photoelectric conversion elements, whether or not there are one or more optical images projected on said photoelectric conversion face;

(d) the step of selecting the semiconductor member to be further examined and positioned where there are a plurality of optical images examined in step (c) by using one optical image from among the optical images on said photoelectric conversion face, wherein said selecting step includes the step of determining, based on the detected distribution of the first and second photoelectric conversion elements, the number of columns in respective left and right column groups and the number of rows in respective top and bottom row groups and step of detecting, upon comparison between the number of columns in said left column group and said right column group and between the number of rows in said top row group and said bottom row group, one of the optical images which covers an area occupied by said column group having the greater number of columns and an area occupied by said row group having the greater number of rows;



(e) the step of examining, based on the detected distribution of the first and second photoelectric conversion elements and on the determined number of rows and number of columns, whether or not the semiconductor member corresponding to said one optical image judged to be present in said step (c) and selected in said step (d) is qualified; and

(f) the step of positioning in a specified position said semiconductor member judged to be qualified in said step (e), and wherein the semiconductor member is an individual one of a plurality of semiconductor members arranged at prescribed intervals into rows and columns, said positioning step (f) including the automatic feed step of stepwise moving as a whole said plurality of semiconductor members thereby to perform the examining and positioning of each semiconductor member in turn, and wherein a

boundary mark surrounds said plurality of semiconductor members, said automatic feed step including the step of stepwise moving said semiconductor members as a whole along one row or column direction for examining and positioning each member and subsequently stepwise moving said plurality of semiconductor members as a whole in a direction opposite to said one column or row direction upon detection of said boundary mark, said automatic feed step further including the step of detecting said boundary mark when the examining and positioning of each semiconductor member is performed along said column or row and an end of said column or row has been reached, totalizing the frequency at which said boundary mark is consecutively detected during the stepwise movement of said plurality of semiconductor members as a whole made immediately after said detection of said boundary mark, and, when said totalized value has reached a specified value, stopping the succeeding examining and positioning operation for the semiconductor member.

4,200,394

HOLOGRAM TECHNIQUE FOR ESTABLISHING THE INTEGRITY OF PACKAGES

Oliver H. Bartlett, Jr., Simpsonville, and Charles B. Izard, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 13, 1971, Ser. No. 106,277
Int. Cl.[2] G01B 9/02; G01M 3/00
U.S. Cl. 356—347 **14 Claims**

1. A method for detecting whether a package has been tampered with, comprising the steps of:

coating an object with a transparent material, said material having visible inconsistencies trapped therein;

making a hologram of said coated object, and

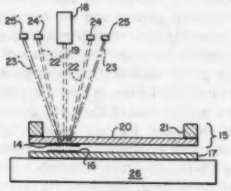
viewing said coated object through said hologram to detect any change in the spacial relationship between a surface of the object and said coating.

4,200,395

ALIGNMENT OF DIFFRACTION GRATINGS

Henry I. Smith, Sudbury, Mass.; Stewart S. Austin, Queens, N.Y., and Dale C. Flanders, Guilford, Me., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 3, 1977, Ser. No. 793,259
Int. Cl.[2] G01B 9/02
U.S. Cl. 356—356 **41 Claims**



1. Alignment apparatus comprising,

first and second relatively movable plates each having diffraction grating means of the same period for diffracting incident wave energy,

a source of substantially monochromatic wave energy,

means for illuminating with said wave energy the diffraction grating means on said second plate through the diffraction grating means on said first plate to produce at least one pair of diffracted beams of wave energy,

and detecting means for detecting the relative intensities of said at least one pair of diffracted beams,

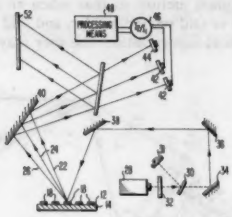
whereby detection of predetermined relative intensities is representative of said first and second plates being in predetermined alignment.

4,200,396

OPTICALLY TESTING THE LATERAL DIMENSIONS OF A PATTERN

Hans P. Kleinknecht, Bergdietikon, Switzerland, and Wolfram A. Bösenberg, Monmouth Junction, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,190
Int. Cl.[2] G01N 21/32
U.S. Cl. 356—384 **10 Claims**



1. A method of optically testing the lateral dimensions of a pattern of material disposed on a substrate comprising the steps of:

applying said material to both said substrate and a test surface,

selectively removing said material from both said substrate and said test surface simultaneously to form respectively said pattern on said substrate and a diffraction grating on said test surface including spaced strips of said material having a strip width W and a periodicity d,

exposing said diffraction grating to a beam of monochromatic light, whereby said diffraction grating and said test surface therebeneath function as a relief pattern, diffracting said beam of monochromatic light into diffracted beams of various orders,

measuring the intensity of two of the diffracted beams (I_1 and I_2) to obtain two intensity signals,

transmitting said intensity signals (I_1 and I_2) to processing means for determining the strip width W, and

comparing said strip width W with a pre-established value to obtain a difference signal, whereby the magnitude of said difference signal is a measure for the lateral dimensional tolerance of said pattern.

4,200,397

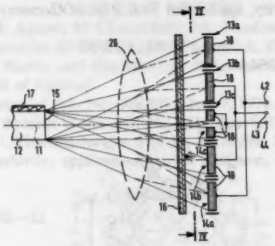
APPARATUS FOR DISTINGUISHING BETWEEN PREDETERMINED RANGES OF ANGLES AT WHICH LIGHT RAYS LEAVE A SURFACE

Erwin Sick, Icking; Klaus Hartmann, Münich, and Heinz Henneberger, Stockdorf, all of Fed. Rep. of Germany, assignors to Erwin Sick GmbH Optik-Elektronik, Waldkirch, Fed. Rep. of Germany

Filed Jun. 12, 1978, Ser. No. 914,802
Claims priority, application Fed. Rep. of Germany, Jun. 21, 1977, 2727927
Int. Cl.[2] G02B 27/00
U.S. Cl. 356—429 **60 Claims**

1. Apparatus suitable for distinuishing between predetermined ranges of angles at which light rays leave a point on a surface, the apparatus comprising a light conducting rod of substantially circular section said light conducting rod being disposed parallel to the surface for receiving light rays reflected from the point onto its surface and having means capable of transmitting said light rays to an end face of the light conducting rod and producing at the end face of the rod an angular separation of the emergent light rays, said angular

separation being related to the angle of incidence of said light ray along the rod relative to the optical axis thereof, there being further provided several photoelectric detector arrangements spaced apart from the end face of said light conductng



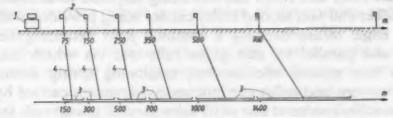
rod and each disposed to receive the light from at least a major portion of a respective one of a series of annular apertures through which said angularly separated light leaving said light conducting rod passes, each said aperture and its associated detector being associated with a particular range of angles.

4,200,398

AUTOMATIC VISIBILITY MEASURING SYSTEM

Anders Persson, and Sven-Erik Söderström, both of Vesteras, Sweden, assignors to ASEA Aktiebolag, Vesteras, Sweden

Filed Nov. 1, 1977, Ser. No. 847,442
Claims priority, application Sweden, Nov. 3, 1976, 7612218
Int. Cl.[2] G01N *21/22*
U.S. Cl. 356—437 **4 Claims**



1. A visibility measuring system which comprises

a means capable of emitting radiation in a multiplicity of different, predetermined directions into the medium in which the visibility is to be measured, each different, predetermined direction being representative of a different, predetermined distance from said radiation-emitting means,

at least one means for receiving and detecting the radiation after it has been emitted from said radiation-emitting source in one of the different, predetermined directions such that it has passed through one of said different, predetermined distances in said medium, each distance representing a particular range of visibility from said radiation emitting means,

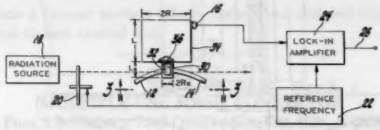
means for automatically and continuously controlling the direction of emission of radiation into said medium from said radiation-emitting means based upon output signals from said radiation-receiver means, said direction-controlling means controlling the direction of emission of radiation so as to be stepped over to pass through a longer predetermined distance between said radiation-emitting means and said radiation-receiver means if the amplitude of radiation measured by said radiation-receiver means is higher than a certain predetermined level, to be stepped over to pass through a shorter predetermined distance between said radiation-emitting means and said radiation-receiver means if the amplitude of radiation measured by said radiation-receiver means is below a certain predetermined level, or to pass through the same predetermined distance between said radiation-emitting means and said radiation-receiver means if the amplitude of radiation measured by said radiation-receiver means is too low for stepping over to the longer predetermined distance and too high for stepping over to the shorter predetermined distance, thereby terminating further stepping of the measuring system.

4,200,399

RESONANT OPTOACOUSTIC SPECTROSCOPY APPARATUS

Harry J. Kimble, Royal Oak, and David M. Roessler, Madison Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1978, Ser. No. 961,994
Int. Cl.[2] G01J *3/42*; G01N *21/22*
U.S. Cl. 356—437 **1 Claim**



1. An optoacoustic spectroscopy apparatus having a fast response time to constituent changes in a flowing or stationary gas comprising

a resonant chamber dimensioned to have a fundamental acoustic resonance frequency below 10 kHz,

an absorption cell having dimensions substantially smaller than the resonant chamber and acoustically coupled to the resonant chamber, the absorption cell having inlet and outlet ports to accommodate the flow of gas therethrough,

means for irradiating the absorption cell contents with periodic pulses of radiation absorbed by a constituent of the gas to produce corresponding pressure variations in the cell, the radiation being pulsed at a resonant frequency of the resonant chamber whereby pressure oscillations at said resonant frequency are produced in the absorption cell and coupled to the resonant chamber where corresponding pressure oscillations of increased magnitude are induced, and

means coupled with the resonant chamber to measure the pressure oscillations therein and produce an electrical output which is a measure of the radiation absorbing constituent in the absorption chamber.

4,200,400

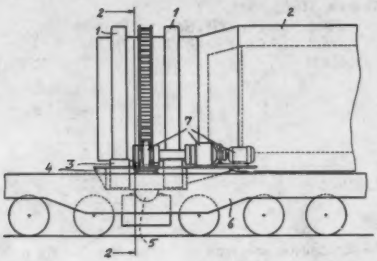
MIXING CAR FOR TRANSPORTING MOLTEN METALS

Winfried Laubach; Heinz Kienbaum, both of Oberhausen, and Rolf Thomas, Bottrop, all of Fed. Rep. of Germany, assignors to Gutehoffnungshütte Sterkrade A.G., Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 971,942
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758293
Int. Cl.[2] B01F *9/02*
U.S. Cl. 366—233 **4 Claims**

1. A mixing car for transporting molten metals, comprising, a car undercarriage, a longitudinally elongated mixing vessel rotatably supported on said undercarriage, support means on said undercarriage for rotatably supporting said vessel for rotation about its longitudinal axis, first and second longitudinally spaced ball bearing races carried on the periphery of said vessel adjacent an end thereof, an annular drive gear disposed between said first and second annular ball bearing races and around said vessel, drive means including a drive pinion engaged with said annular gear for rotating said vessel, said support means including at least one support bridge frame, mounting means mounting said support bridge frame for universal pivotal movement on said undercarriage, a longitudinally extending roller shaft journalled in said support bridge frame adjacent each side thereof, antirotation safety means

engaged with said support bridge frame and said roller shaft to hold said roller shaft against rotation in respect to said support bridge frame, said roller shaft having an end part at each end extending outwardly beyond said support bridge frame, a hollow vessel support roller engaged over said shaft, roller bearing means between said hollow support roller and said shaft for rotatably supporting said hollow support roller on said shaft so that the exterior of said support roller engages against a respective first and second race, an interior roller



retainer affixed to said shaft exteriorly of said roller bearings, an interior roller carried by said retainer at diametrically opposite locations engaged with the interior of said support roller and permitting unlimited pendulum motion of said support roller about an axis extending through the center of rotation of said support roller and the axis of rotation of said interior support rollers and only extremely restricted pendulum motions of the support roller about an axis extending through the axis of said mixing rollers and the axis of said support vessel.

4,200,401

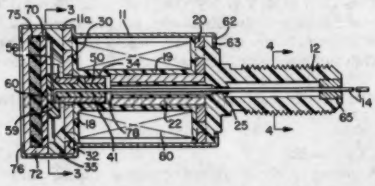
PRINT WIRE SOLENOID

Kenneth L. Roy, Centerville, and Philip E. Fugate, Dayton, both of Ohio, assignors to Ledex, Inc., Dayton, Ohio

Filed May 22, 1978, Ser. No. 908,153

Int. Cl.[2] B41J *3/10*

U.S. Cl. 400—124 **10 Claims**



4. As a subcombination of a print wire solenoid, an improved armature assembly comprising an injection molded plastic support body, an armature encapsulated in said body, a print wire having one end molded in saidbody and extending axially of said armature, and a retraction spring molded in said body.

9. An improved stator construction for a solenoid comprising an injection molded plastic body having spaced front and rear walls, and a central tubular section for receiving a coil of electric wire thereon between said walls, a stator core encapsulated in said body in said tubular section, and said front wall further having an integral portion extending forwardly thereof providing a mounting attachment for the solenoid.

4,200,402

CARRIAGE GUIDE FOR TYPING ELEMENT CARRIER

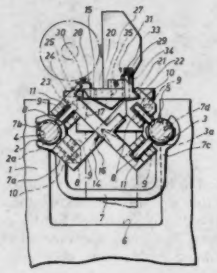
Albert Rix, Wilhelmshaven, Fed. Rep. of Germany, assignor to Olympia Werke AG, Wilhelmshaven, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 936,137

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1977, 2738496

Int. Cl.[2] B41J *25/30*

U.S. Cl. 400—354.1 **9 Claims**



1. In a carriage guide for supporting a typing element carrier and composed of two guide rails extending parallel to a printing abutment, and pairs of guide rollers mounted on intersecting axes and connected with the typing element carrier for centering the typing element carrier at at least one of the guide rails, the improvement comprising first and second roller carriers carrying said guide rollers at sides thereof extending parallel to said rails, said roller carriers being disposed to intersect one another and said second roller carrier being provided with a slide edge; means defining a common joint extending between, and parallel to, said guide rails and via which said carriers bear against one another; tensioning spring means acting between said roller carriers; receiving means carried by said first roller carrier at one of its sides parallel to said rails for establishing an articulated connection with said typing element carrier; and supporting spring means cooperating with said slide edge for effecting a force-locking effective connection between said second roller carrier and said typing element carrier.

4,200,403

WRITING IMPLEMENTS

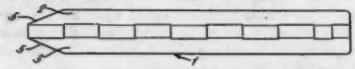
David Y. Chu, Flat 14A Twinbrook, 43 Repulse Bay Rd., Hong Kong, Hong Kong

Filed Sep. 18, 1978, Ser. No. 943,468

Claims priority, application United Kingdom, Apr. 21, 1978, 15888/78

Int. Cl.[2] B43K *23/00, 24/06, 19/00, 21/00*

U.S. Cl. 401—6 **3 Claims**



1. A writing implement comprising a pair of leaves each formed to have a longitudinally extending bore therein, said leaves being cut-away in a manner complementary to one another such that projecting portions of one of said leaves can engage in recesses in the other of said leaves and vice versa with said bores in said two leaves coaxial in the manner of a hinge, and a writing member extending through said coaxial bores in said two members, said two leaves being relatively pivotable about the axis of said coaxial bores between a storage configuration in which said leaves lie substantially in the same

plane and a writing configuration in which the planes in which said two leaves lie are at an acute angle one to the other.

4,200,404

LOOSE LEAF BINDERS

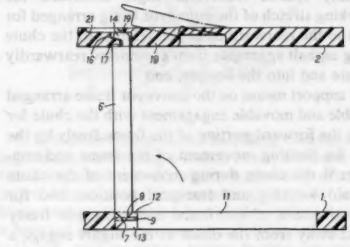
Kenneth M. Agnew, 10 Chesterfield Rd., London W4; Charles H. P. Denroche, 90 Park Rd., Hampton Wick, Kingston-upon-Thames, Surrey, and Roy Hewlett, 46 Lytton Grove, London SW15, all of England

Continuation of Ser. No. 748,891, Dec. 9, 1976, abandoned, which is a division of Ser. No. 467,363, May 6, 1974, Pat. No. 4,000,951. This application Sep. 19, 1978, Ser. No. 943,862

Claims priority, application United Kingdom, May 8, 1973, 21950/73

Int. Cl.² B42F *13/14*

U.S. Cl. 402—22 **13 Claims**



1. A releasable coupling comprising a first member having an opening extending thereinto from a face thereof and a first bearing surface which is at an edge of the opening and faces away from said face, a second member insertable in the opening from the said face with a second bearing surface on the second member for engagement with the first bearing surface, and locking means for preventing said first and second members from being disconnected from one another due to relative movement therebetween, said locking means comprising a locking member forming part of the first member and movable into the opening in a first direction which is opposite to the direction of insertion of said second member to retain the second bearing surface releasably against the first bearing surface, said locking member being movable out of the opening in a direction opposite to said first direction to permit separation between said first and second members, said locking member defining accessible manual engagement means thereon, said locking member when positioned in the opening retaining the first and second bearing surfaces in contact and preventing separation between the first and second members until said locking member is moved manually out of said opening.

4,200,405

ANGLE JOINT

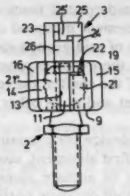
Hans J. Bauer, Am Eichenhain 8, D-8503 Röthenbach, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,624

Int. Cl.² F16C *11/06*

U.S. Cl. 403—142 **8 Claims**

1. An angle joint including a ball socket and a ball pin, the ball of said ball pin residing in the ball socket, said ball socket having a body which is bifurcated by a central slot, thereby defining two elastically yielding jaws, and further including a locking device for preventing relative motion of said jaws after emplacement of said ball in said ball socket, and wherein, according to the invention, said ball socket is provided with a transverse channel extending normally with respect to said central slot, said transverse channel having respective channel portions which lie in said jaws and defining a cross section profile and wherein there is provided a locking bolt being received in said transverse channel to thereby lock together said jaws and wherein there is provided in one of said channel



portions a cut-out portion which opens from said one channel portion to said central slot.

4,200,406

MULTIPLE-USE JOINT CONNECTOR

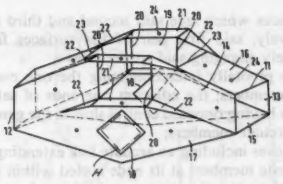
Otto Fuss, Läufelsberg, 7583 Ottersweier, Fed. Rep. of Germany

Filed Jun. 13, 1977, Ser. No. 806,144

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626716

Int. Cl.² E04H *12/06*

U.S. Cl. 403—231 **11 Claims**



1. A multiple-use joint connector made of any suitable material, including plastic, sheet metal, and wood, particularly for roof structures, which comprises:

two interconnected receiving sections each having two pairs of opposite side walls, said receiving sections being open at both ends and having their central longitudinal axes form an angle with one another while being located in a common plane, said receiving sections being adapted to respectively receive rafters, those end edges of the respective receiving sections which face each other defining a space of sufficient size to allow introduction of a ridge beam into said space at least transverse to said common plane, those corresponding pairs of said side walls of each of said receiving sections which are parallel to said common plane being provided with extensions for effecting said interconnection of said receiving sections, each of said extensions having at least one corresponding opening, each pair of corresponding openings of said extensions being aligned and adapted to receive one beam in such a way that said beam is transverse to said common plane; and flange means extending from at least one corresponding side wall of each of said receiving sections outwardly from and transverse to said common plane, said flange means being provided with extensions which are connected to said side wall extensions so as to confine same.

4,200,407

BOLTED ANNULAR LOCKING COLLAR FOR A SHAFT

Romolo P. Bianco, 2803 Grindley Pk., Dearborn, Mich. 48124

Filed Apr. 18, 1979, Ser. No. 31,269

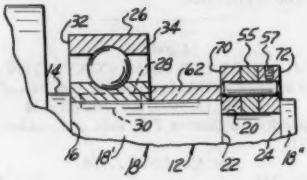
Int. Cl.² B25G *3/00*

U.S. Cl. 403—261 **8 Claims**

1. In combination, a shaft of varying diameter, with a first portion of the shaft containing a first abutment and with a

second portion of the shaft having a diameter smaller than the first portion and being provided with an annular groove having oppositely facing second and third abutments which are axially aligned with and spaced from said first abutment, at least one sleeve-like element mounted on said second portion of the shaft at the side of said groove closest to said first abutment for engagement therewith, a spacer sleeve mounted on said second portion of the shaft at one end operably engaging said sleeve-like element and at its other end extending to said annular groove;

an annular locking device for retaining said sleeve-like element against said first abutment, said locking device being formed by a pair of arcuate members disposed in said annular groove about opposite portions of said shaft, each of said arcuate members having a pair of first and second



flat surfaces which face said second and third abutments respectively, said first pair of flat surfaces facing and operatively engaging said spacer sleeve;

first means pivotally interconnecting the one ends of said arcuate members; the adjacent one ends of said arcuate members having opposed central slots in the general plane of said arcuate members;

said first means including an arcuate link extending between said arcuate members at its ends nested within said slots;

and pivot pins extending transversely through end portions of said arcuate members and link;

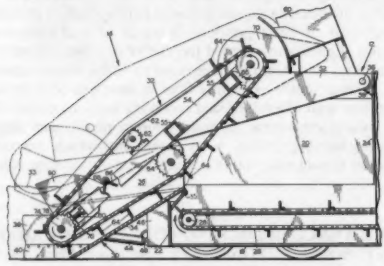
and second means interconnecting and adjustably securing the other ends of said arcuate members for anchoring said arcuate members within the shaft annular groove and tightly against said spacer sleeve for retaining said sleeve-like element between said first and third abutments.

4,200,408

WINDROW PICKUP ATTACHMENT FOR ASPHALT PAVEMENT LAYING APPARATUS

Richard G. Babler, Milwaukie; George V. Stinchfield, Candy, and Melvin W. Kannard, Portland, all of Oreg., assignors to Babler Bros., Inc., Portland, Oreg.

Filed Nov. 13, 1978, Ser. No. 960,238
Int. Cl.[2] E01C *19/00*
U.S. Cl. 404—83 **8 Claims**



1. In asphalt pavement laying apparatus including a longitudinally aligned asphalt aggregate spreading unit and a hopper arranged for feeding aggregate thereto, the hopper including a high back wall, a low front wall, and on its bottom a longitudinally extending conveyor, a windrow pickup attachment comprising in combination with the hopper:

(a) a chute mounted pivotally at its rearward end adjacent the upper end of the front wall of the hopper and extending longitudinally forward thereof,

(b) drive means interengaging the chute and hopper for pivoting the chute between a lowered, working position for receiving asphalt aggregate from a windrow, and a raised, transport position,

(c) an elongated conveyor frame mounted pivotally at its rearward end adjacent the upper end of the back wall of the hopper and extending forwardly thereof over the hopper and chute,

(d) an elongated endless flight conveyor supported at its longitudinal ends on the conveyor frame for longitudinal movement relative thereto and including a plurality of longitudinally spaced transverse flight members, the lower working stretch of the conveyor being arranged for movement in the rearward direction relative to the chute for moving asphalt aggregate from a windrow rearwardly up the chute and into the hopper, and

(e) conveyor support means on the conveyor frame arranged for releasable and movable engagement with the chute for supporting the forward portion of the frame freely by the chute and for limiting movement of the frame and conveyor toward the chute during movement of the chute between said working and transport positions and for allowing movement of the frame and conveyor freely toward and away from the chute as the flights engage a windrow of asphalt aggregate.

4,200,409

PROTECTIVE SIDE WALL FOR TABULAR ICEBERGS

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Apr. 24, 1978, Ser. No. 899,250
Claims priority, application France, Apr. 22, 1977, 77 12179
Int. Cl.[2] E02B *1/00*
U.S. Cl. 405—52 **7 Claims**

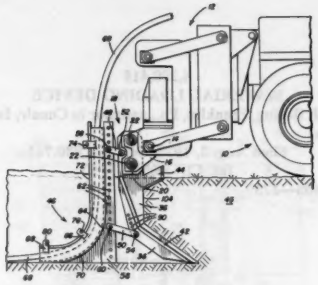
1. A protective side wall for icebergs, which, when in position adjacent a side face of an iceberg, retains at least one vertical layer of calm water between itself and the iceberg; comprising panels displaced from the side face of the iceberg, the width of each panel being greater than its height; said panels being joined to one another and tensioned by ballast, being separately suspended from suspension cables attached to an upper surface of the iceberg, and including zig-zag spacing tubes inserted where said panels are joined to one another, some of the zig-zag tubes having elbows engaging the face of the iceberg, whereby the panels are maintained at a substantially constant distance from the side face of the iceberg.

4,200,410

CABLE LAYING DEVICE

Edward S. Baker, 717 S. Birch Pl., and Richard M. Talley, 2123 S. 1st Pl., both of Broken Arrow, Okla. 74012

Filed May 15, 1978, Ser. No. 906,250
Int. Cl.[2] E02F 5/02; F16L 1/00
U.S. Cl. 405—182 12 Claims



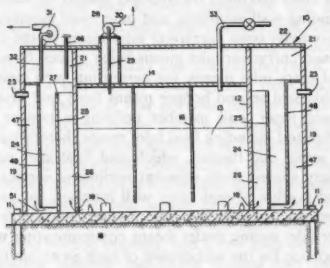
1. In a cable laying device including excavating means having a blade for forming a trench in soil and cable laying means for laying cable in said trench rearwardly of said blade, the improvement comprising mounting means for said blade, said blade forming said trench to a predetermined depth and having a forward edge presenting a predetermined angle of attack to said soil, said mounting means having adjusting means for adjusting said depth and for adjusting said angle of attack, the adjusting means being adapted for selectably adjusting either said depth at the same predetermined angle of attack or for adjusting the predetermined angle of attack at the same depth, whereby said predetermined angle of attack can be maintained at the optimum attack angle for efficient excavation of soil to form said trench, the device further including rigid connecting means for maintaining said cable laying means in spaced relation to said excavating means, said rigid connecting means permitting vertical movement of said cable laying means without change of the angle presented by said cable laying means to said soil.

4,200,411

SUBMERGED OFFSHORE STORAGE FACILITY

George R. Brown, Lagos, Nigeria; Joseph C. Carroll, Abqaiq, Saudi Arabia, and Sidney E. Dubuisson, Kokkedal, Denmark, assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 17, 1978, Ser. No. 925,133
Int. Cl.[2] B65G 5/00; E02D 27/38, 29/00
U.S. Cl. 405—210 4 Claims



1. A liquid storage facility for an underwater site to hold varying quantities of water, as well as a liquid having a density less than that of water, by maintaining the tank in a full condition under all operating circumstances, which facility includes;

a continuous inner wall (12) having an upper closure (14) which defines a central storage tank for concurrently holding amounts of said respective liquids,

conduit means (29 and 33) communicated with said central storage tank for controllably regulating the amount of liquid held therein,

means forming a collecting chamber communicated with the lower end of said storage tank and being segregated from the surrounding water,

panel means (27) disposed within said collecting chamber forming the latter into upright compartments (24 and 26) which are in communication at the panel (27) upper edge,

withdrawal means (31 and 32) in said collecting chamber being operable to withdraw liquid therefrom, and

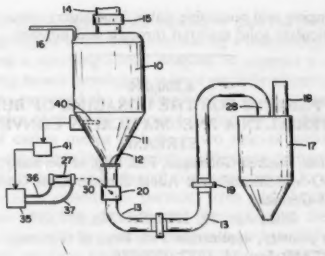
sensing means in said collecting chamber which is sensitive to the presence of said less dense liquid within said collecting chamber, and which is integral with said withdrawal means (31 and 32) for activating the latter in response to the presence of said lighter liquid.

4,200,412

CONTROL FOR PNEUMATIC CONVEYING SYSTEM

James R. Steele, Stillwater, Minn., assignor to Dynamic Air Incorporated, St. Paul, Minn.

Filed Apr. 20, 1978, Ser. No. 898,467
Int. Cl.[2] B65G 53/66
U.S. Cl. 406—22 6 Claims



1. In a system for pneumatically conveying granular materials, said system including a source vessel containing material to be conveyed and pressurized gas for conveying the material, a receiver, and a conveying line between said source vessel and the receiver, the improvement comprising: a valve located in the conveying line for limiting flow of gas between the source vessel and the receiver, said valve containing a passageway for allowing limited flow in the conveying line when the valve is closed; means for sensing the amount of material being conveyed; and means coupled to said valve and responsive to said sensing means for closing the valve when the amount of material is sensed at a predetermined level.

4,200,413

PIPELINING PARTICULATE SOLID MATERIAL AS STABLE FOAM SLURRY

John L. Fitch, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,001
Int. Cl.[2] B65G 53/30
U.S. Cl. 406—49 4 Claims

1. A method of transporting particulate solid material through a pipeline, comprising:

(a) mixing a first portion of said particulate solid material with an aqueous liquid to form a liquid slurry thereof;

(b) pumping said liquid slurry though a first conduit;

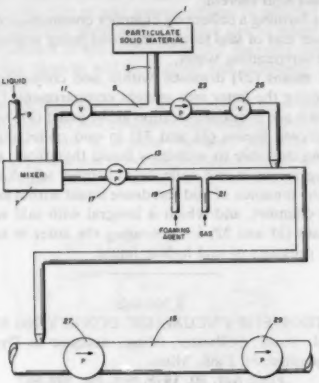
(c) injecting into said first conduit at a first injection point and into said liquid slurry a foaming agent selected from the group consisting of surfactants and soaps;

(d) injecting into said first conduit at a second injection point

downstream of said first injection point and into said liquid slurry a gas in an amount sufficient to form a pumpable stable foam slurry;

(e) injecting a second portion of said particulate solid material into said first conduit downstream of said second injection point and into said pumpable stable foam slurry; and

(f) pumping said pumpable stable foam slurry containing said particulate solid material through said pipeline.



4,200,414

APPARATUS FOR THE DOSAGING OF BULK MATERIAL IN A PNEUMATICALLY CONVEYED STREAM

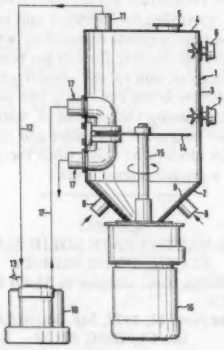
Otmar Link, Buchen-Götzingen, Fed. Rep. of Germany, assignor to AZO-Maschinenfabrik Adolf Zimmermann GmbH, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,697

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717145; Jun. 24, 1977, 2728386

Int. Cl.[2] B65G *53/46*

U.S. Cl. 406—63 **9 Claims**



1. Apparatus for dosaging of bulk material into a pneumatic conveying stream comprising a disc having a number of through holes and mounted for rotation about an axis, a column of bulk material, a pneumatic conveying conduit having a slot therethrough and sealing means on edges of said conduit slot, said disc and through holes being sized and positioned relative to said conduit sealing means and column for taking up bulk material in said through holes as said disc rotates within said column and passing between said sealing means in abutting contact therewith, with a plurality of said through holes being completely within said conduit to enable delivery of said bulk material at a substantially constant rate.

4,200,415

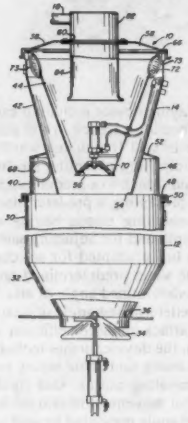
MATERIAL LOADING DEVICE

Douglas J. Boring, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed Aug. 3, 1978, Ser. No. 930,715

Int. Cl.[2] B65G *53/60*

U.S. Cl. 406—173 **6 Claims**

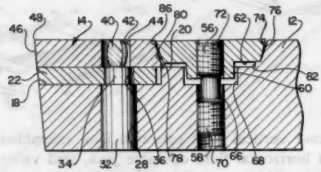


1. A device for receiving a granular or pulverant material transported thereto in suspension with a flowing airstream, with such material being deposited therein and such airstream being withdrawn therefrom comprising: first generally vertically oriented hopper means having entry inlet means adjacent an upper end portion thereof for permitting such airstream flow therein; second generally vertically oriented hopper means having a lower end portion thereof sealingly received within said upper end portion of said first hopper means and extending upwardly therefrom; said second hopper means including inner and outer transversely spaced vertically coaxially extending wall members; said outer wall member including downwardly open carryover inlet means at the lowr end thereof, said carryover inlet means being spaced downwardly from said entry inlet means, for permitting such airstream to flow within said second hopper means from said first hopper means; said inner wall member defining a hopper portion therewithin and including final inlet means therethrough adjacent the upper end thereof, which said final inlet means are transversely spaced from adjacent peripheral surfaces of the upper end portion of said outer wall member, for permitting such airstream to flow into said hopper portion from said carryover inlet means; outlet means communicating with said hopper portion for the withdrawal of such airstream from said second hopper means; and generally vertically extending passageway means defined between the spaced transversely adjacent surfaces of said inner and outer wall members to provide constant communication between said carryover inlet means and said final inlet means for the flow of such airstream therebetween.

4,200,416
TOOL WITH INTERCHANGEABLE INSERT

Mitchell Kezran, Cranston, R.I., assignor to Precision Industries, Inc., Providence, R.I.

Filed Apr. 3, 1978, Ser. No. 893,319
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—108 1 Claim

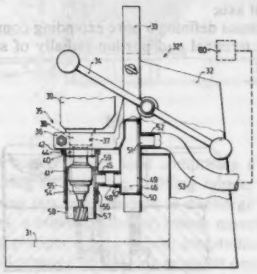


1. A forming tool having an interchangeable insert comprising, a body including a recess at one end thereof, said recess having a first portion, said insert having a cutting surface at a forward edge thereof, a bottom seating surface and a back locating surface, said insert adapted for support on said recess first portion with said bottom surface thereof seated thereon, means for aligning said insert with respect to said body including a pin and a cooperating bore formation on said body and said insert, said recess having a second portion adjacent said first portion at the rear side of said first portion, said second portion terminating in an inclined wedging surface at the opposite rear side thereof, a wedge having opposed rear and forward surfaces in predetermined relation to each other and adapted to simultaneously seat against said second portion wedging surface and the back locating surface of said insert respectively, said rear wedge surface and said second portion wedging surface and said forward wedge surface and said insert back locating surface respectively tapered at essentially the same angles, said second recess portion having an upwardly directed step transversely extending across the width of said second portion at the rear side thereof and positioned adjacent said inclined wedging surface, said wedge having a bottom surface adapted to contact the upper surface of said step, and means connecting said wedge with said holder body and adapted to move said wedge toward seating engagement in said recess wherein said forward surface of said wedge is downwardly tilted about said step whereby said wedge forward surface contacts said insert back locating surface in non-friction locking, substantially line contact therewith, the bottom surface of said wedge being spaced from said second recess portion except at rear portions thereof which contact said step, said second recess portion having a counter-bored opening therein, the bottom section of said opening threaded to receive one end of a double-ended screw, the other end of said screw adapted for receipt in a threaded opening in said wedge, the bottom surface of said wedge having a downwardly extending boss adapted for receipt in the upper section of said second recess portion opening, said screw ends being of opposite threading wherein movement thereof into said recess forces said wedge into initial contact with said step and then forwardly downwardly about said step wherein said front wedge surface contacts said back locating surface in said aforementioned substantial line contact and wherein the upper end of said counter bored opening is of a dimensional extent large enough to permit said boss to rotate back and forth therein.

4,200,417
ARRANGEMENT FOR WITHDRAWING PARTICLES OF MATERIAL REMOVED BY A WORKING TOOL

Klaus Hager, Winterbach, and Klaus Voss, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,893
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715378
Int. Cl.[2] B23Q *11/06*; B24B *55/06*; B27G *21/00*
U.S. Cl. 408—67 19 Claims



1. An arrangement for withdrawing of material removed by a working tool of a machine tool during a machining process, comprising a working frame adapted to support a machine tool; casing means forming an at least partially closed chamber adapted to surround the working tool so as to accommodate the particles of material removed during the machining process, said casing means including two sleeves movable one within another has been inserted; port means communicating with said chamber and adapted to be connected to a suction source so as to aspirate the particles from said chamber; connecting means for connecting said port means to the suction source, said connecting means being mounted on said working frame, said working frame having a hollow portion forming a suction box which communicates with the suction source, on the one hand, and with said chamber of said casing means on the other hand, so as to form said connecting means; and means for mounting said casing means on said working frame so that said chamber surrounds said working tool when said machine tool is supported by said working frame, said mounting means immovably connecting one of said sleeves to said working frame, whereas the other of said sleeves is movable relative to said one sleeve between a plurality of locations and fixable to said one sleeve in each of said plurality of locations.

4,200,418
FLOATING REAMER

Dieter Kress, Aalen, and Friedrich Häberle, Lauchheim, both of Fed. Rep. of Germany, assignors to Mapal Fabrik fur Prazisionswerkzeuge KG, Aalen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 738,327, Nov. 2, 1976, Pat. No. 4,102,594. This application May 19, 1978, Ser. No. 907,599
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1975, 2549325
Int. Cl.[2] B23B *47/00*, *31/02*
U.S. Cl. 408—143 2 Claims

1. In a floating reamer including
a shank member having a longitudinal axis, said shank member being rotatable about said longitudinal axis,
a head member including cutting means thereon operatively mounted upon said shank member, and
connecting means mounting said head member on said shank member for joint rotation about said longitudinal axis, the improvement wherein said connecting means comprise:
a terminal end portion having a generally cylindrical outer

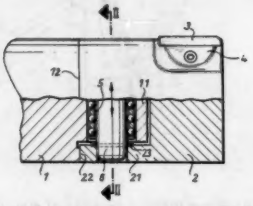
wall extending from an end of one of said head member and said shank member;

an annular wall having a generally cylindrical inner surface extending from the other of said head member and said shank member;

said terminal end portion extending to within said annular wall with said cylindrical outer wall of said terminal end portion surrounded by said cylindrical inner surface of said annular wall;

said annular wall and said cylindrical outer wall being dimensioned to define an annular radial gap therebetween to enable relative movement between said head member and said shank member radially of said longitudinal axis;

wall means defining a bore extending completely through said terminal end portion radially of said longitudinal axis;



a pin extending through said bore radially beyond said cylindrical outer wall of said terminal end portion;

antifriction roller bearing means operatively mounted between said pin and said wall means defining said bore; and

means fixedly mounting said pin in said annular wall;

said roller bearing means being snugly fitted between said pin and said wall means to enable said radial relative movement between said head member and said shank member while preventing axial play therebetween in the direction of said longitudinal axis; and

abutment wall means maintained in abutting engagement between said head member and said shank member by said connecting means, said abutment wall means being arranged such that the abuting pressure therebetween is increased by forces tending to move said head member and said shank member toward each other.

4,200,419

ASSEMBLY FOR POSITIONING PORTABLE STRUCTURES

William J. Rogers, Jr., 4449 Park Blvd., Oakland, Calif. 94602

Filed Oct. 11, 1977, Ser. No. 840,752
Int. Cl.[2] B66F *7/12*
U.S. Cl. 414—12 **8 Claims**

1. An assembly for use in positioning a portable structure comprising:

a first elongated roller bed;

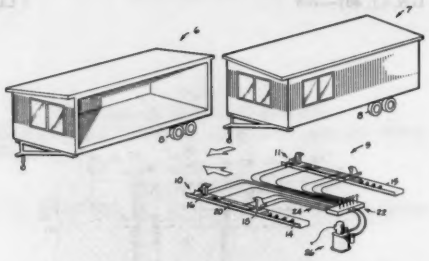
first and second spatially separated vertical fluid operable jack assemblies each including a jack pad positionable on said roller bed for longitudinal rolling movement thereupon, a vertically oriented fluid operated jack and an S-shaped bracket adapted to be received at the rod end of said vertically oriented fluid operated jack, said S-shaped bracket adapted to receive a framing member of a portable structure;

a first horizontal fluid operable jack affixed at one end to said elongated roller bed and fixable at the other end to one of said first and second vertical fluid operable jack assemblies;

a first link assembly selectively interconnecting said first and second spatially separated vertical fluid operable jack assemblies whereby jacking operation of said first horizontal fluid operable jack results in horizontal movement of both said first and second vertical fluid operable jack assemblies;

a source of fluid under pressure;

a valve assembly operatively connected with said first and



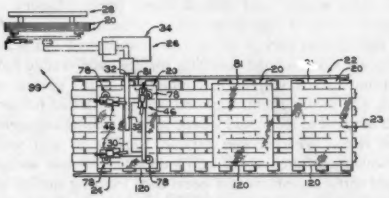
second vertical fluid operable jack assemblies and said first horizontal fluid operable jack, said valve assembly positionable remote of said elongated roller bed and operable to selectively communicate fluid under pressure to each of said vertical fluid operable jack assemblies or said horizontal jack.

4,200,420

FRAME HAVING ROTATING ORIENTING MEMBERS

William P. Cathers, Allison Park, and Charles W. Dorn, Jr., Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 1, 1978, Ser. No. 902,003
Int. Cl.[2] B65G *61/00*
U.S. Cl. 414—107 **13 Claims**



1. A sheet orienting and transporting frame comprising:

structural means containing a pair of longitudinal axis transverse to one another;

a pair of arms each having an engaging surface and a rotating axis;

means for rotatably mounting said pair of arms in relationship to said longitudinal axes with the rotating axis of each of said arms and its respective longitudinal axis subtending an oblique angle;

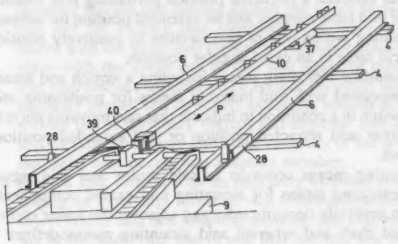
means for rotating said arms to move said engaging surface into a first predetermined position defined as a sheet engaging position and outward of and away from the sheet engaging position toward a second predetermined position defined as a non-engaging position; and

sheet transporting means mounted in relationship to said structural means.

4,200,421
APPARATUS FOR MOVING ARTICLES IN A SHELF STORAGE UNIT

Hans R. Haldimann, Zurich, Switzerland, assignor to Weelpal A.G., Zug, Switzerland

Filed Jun. 7, 1976, Ser. No. 693,505
Claims priority, application Austria, Jun. 6, 1975, 4341/75; Switzerland, Nov. 26, 1975, 15427/75
Int. Cl.[2] B65G *1/06*
U.S. Cl. 414—280 8 Claims

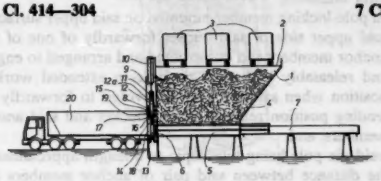


1. A continuous storage shelf unit, comprising:
an inclined rail track having a loading end and an unloading end;
means for loading and unloading said shelf;
a plurality of wheeled carriages mounted for movement along said rail track;
momentum imparting means mounted for longitudinal movement relative to said rail track for engaging said carriages and initiating movement of said carriage along said track and comprising:
a push rod mounted centrally of said rail track for longitudinal movement relative thereto;
entrainment means for engaging said carriages and for regulating the speed of said carriages, comprising a plurality of levers having at least a single lever arm pivotally mounted on said push rod and a plurality of elastically yielding restoring devices with low natural frequency and high self damping for urging said levers into operating positions extending into the path of said carriages,
at least one of said levers engaging said carriages upon motion of said push rod,
at least one of said restoring devices urging at least one of said levers to engage a slowly moving carriage and to impart energy thereto,
said restoring devices each comprising a hollow cylindrical resilient body located between one of said levers and said push rod;
said rail track having a downward incline in the direction of its unloading end such that the acceleration of said carriages resulting from said incline is less than the deceleration caused by rolling friction between said carriages and rail track to normally prevent movement of said carriages along said rail track and to decelerate said carriages after movement is imparted thereto,
whereby momentum is imparted to said carriages by said push rod and said levers, and whereby said restoring devices and said levers are capable of withdrawing energy from, and imparting energy to, a moving carriage.

4,200,422
CLOSURES OF BUNKERS FOR HOLDING REFUSE

Eberhard Stodt, Düsseldorf, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 3, 1978, Ser. No. 866,240
Claims priority, application Fed. Rep. of Germany, Jan. 14, 1977, 2701336
Int. Cl.[2] B65G *67/20*
U.S. Cl. 414—304 7 Claims

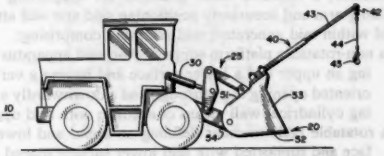


1. In a refuse bunker of the kind comprising a horizontal pressing box having an open top, a filling hopper positioned above said pressing box and arranged to discharge refuse into said pressing box, a pressing plunger, means movably mounting said pressing plunger for movement longitudinally of said pressing box, said pressing box having an outlet opening at one end thereof and said means movably mounting said plunger arranged to feed refuse from said pressing box through said outlet opening and, in use, into a container, the improvement comprising closure means for said outlet opening located outside of said outlet opening from said pressing box, said closure means including means defining three passage openings for the passage of refuse from said outlet opening, said passage openings being disposed in two spaced-spart vertical planes, said passage defining means including a stationary first member defining one of said passage openings and situated in a plane spaced from said outlet opening, a movable second member defining the other two passage openings and located between said outlet opening and said first member, said passage opening in said stationary member being aligned with said outlet opening, means for vertically moving said second member defining the other two of said three passage openings, said other two passage openings being spaced apart one above the other and being of different heights from each other.

4,200,423
STORABLE BOOM ATTACHMENT FOR A CONSTRUCTION MACHINE

Earl W. Sornsin, 1743 S. 9th St., Fargo, N. Dak. 58102

Filed Aug. 30, 1978, Ser. No. 937,992
Int. Cl.[2] B66C *23/54*; B66F *9/00*
U.S. Cl. 414—724 11 Claims



1. A hoisting gin comprising:
(a) a front-end loader having a pivotally mounted bucket extending transversely thereof at its forward end;
(b) said bucket having end and upper and lower side walls;
(c) a pair of oppositely disposed anchor members mounted upon an upper surface of said upper side wall of said bucket in laterally spaced relation adjacent opposite ends

of said bucket and each constructed and arranged to pivotally anchor a gin pole upon said bucket;

(d) a longitudinally telescopic gin pole constructed and arranged to have its inner end received within one of said anchor members in pivoted anchored relation for pivotal movement about a substantially vertical axis between an anchored forwardly extending working position and a transverse stored position adjacent the other of said anchor members;

(e) a pole-locking member mounted on said upper surface of said upper side of said bucket forwardly of one of said anchor members and constructed and arranged to engage and releasably lock said gin pole in extended working position when said gin pole is pivoted to forwardly extending position relative to said bucket and said anchor members; and,

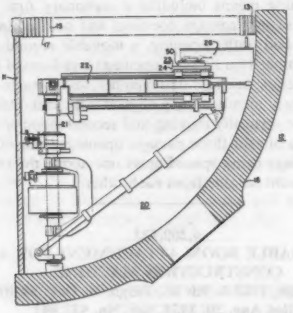
(f) said gin pole being telescopic to a length approximating the distance between said pair of anchor members and having its outer end constructed and arranged to be engaged and secured by said other anchor member when said gin pole is so telescoped and pivoted to its stored position whereat it extends transversely of said loader and longitudinally of its said bucket.

4,200,424

REMOTELY CONTROLLED TOOL POSITIONING TABLE

Kenneth S. Gerkey, Mt. Lebanon, and Edward H. Smith, New Alexandria, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 14, 1978, Ser. No. 896,530
Int. Cl.[2] B25J 9/00
U.S. Cl. 414—744 **2 Claims**



1. In combination with a remotely operated and monitored tool support and positioning apparatus for retubing a steam generator, a rotatable table assembly for supporting a tool holding arm and accurately positioning said arm and attached tool within said generator, said assembly comprising:

a non-rotatable platform supported on said apparatus defining an upper and a lower surface and having a vertically oriented opening therethrough and a downwardly extending cylindrical wall means concentric with said opening;

a rotatable table member defining an upper and lower surface and supported with said lower surface spaced above the upper surface of said platform and having a vertically oriented opening therethrough and a downwardly extending hollow shaft means, concentric with said table opening, positioned within said cylindrical wall means in a spaced relation, said lower surface of said table member defining a plurality of downwardly open cavities having a downwardly diverging wall and angularly spaced at a common radius from the axis of rotation of said table member;

bearing means for rotatably supporting said table member on said platform;

drive means including a reversible motor drivingly engaging said shaft for rotating said table member in either direction of rotation and having a slight permissible degree of backlash and means drivingly engaged by said shaft and responsive to the rotation thereof for generating a signal relative to the angular position of said table member from a preset position;

indexing means including a movable pin having an upwardly converging wall complementary to said cavity wall and disposed within a vertical aperture in said platform at a radius common to said cavities and means for moving said pin between a retracted position permitting free rotation of said table member and an extended position for indexed seating within one of said cavities to positively position said table in an exact angular position;

a condition indicating means including a switch and means associated with said indexing means for positioning said switch in a condition to indicate that said movable pin is in either said retracted position or said extended position; and,

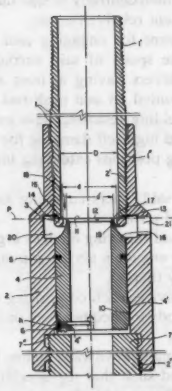
mounting means common to said motor and said signal generating means for mounting said named components on generally opposite sides and adjacent the lower end of said shaft and wherein said mounting means defines a configuration which permits service lines to pass from beneath the assembly to above said table member through said hollow shaft.

4,200,425

GAS-LIFT DEVICE

Constantin Teodorescu; Ilie Chiriac; Cornel D. Sava; Adrian Drăghici, and Sabin Zinca, all of Bucharest, Romania, assignors to Institutul National Pentru Creatie Stiintifica Si Tehnica-Increst, Bucharest, Romania

Continuation of Ser. No. 653,004, Jan. 28, 1976, Pat. No. 4,090,814. This application Mar. 14, 1978, Ser. No. 886,611
Claims priority, application Romania, Feb. 12, 1975, 81391
Int. Cl.[2] F04F 5/44
U.S. Cl. 417—178 **3 Claims**



1. A gas-lift device to be fitted in a well string for the withdrawal of petroleum from a subterranean deposit, comprising:

a first cylindrical adapting member having a throughgoing axial bore and provided with external threads adjacent the upper and lower ends thereof, said upper threads being engagable with said well string;

a cylindrical sleeve having internal threads formed adjacent the upper and lower ends thereof, said upper internal

threads engaging said lower external threads of said first adapting member;

a second adapting member having a throughgoing axial bore and formed with external threads engaging said lower internal threads of said sleeve against an inwardly stepped shoulder thereof, said second adapting member being engageable with said well string;

a cylindrical intermediate member having a throughgoing axial bore, said intermediate member being threadly received in said sleeve between said shoulder and said first adapting member, said intermediate member being provided with a radial slot formed near the lower threaded end thereof defining a deflectable portion therewith, said deflectable portion being spanned by a set screw axially threaded therein and bearing against the upper surface of said slot for locking said intermediate member in said sleeve with the upper end thereof in a common transverse plane with the lower end of said first adapting member, said intermediate member being further provided with an inwardly curved and upwardly extending annular portion formed in the periphery thereof and adjacent said upper end thereof, said upper end lying inwardly of the wall of said axial bore in said first adapting member;

a profiled ring formed with an internally threaded step engaging an externally threaded step formed adjacent said lower end of said first adapting member, said ring extending below said lower end of said first member and having an inner diameter lying inwardly of the wall of said axial bore and forming an annular ledge therewith, said annular ledge lying outwardly of said upper end of said intermediate member and in the same plane therewith; and

an upwardly directed annular slot formed between said annular ledge and said upper end of said intermediate member, and forming a turbulence nozzle therewith, said slot extending downwardly and outwardly in an increasingly widening gap defined between said profiled ring and said inwardly curved and upwardly extending annular portion of said intermediate member, said gap communicating with an annular distribution chamber formed in the inner surface of said sleeve, said chamber being supplied with pressurized gas through an inlet formed in the wall of said sleeve.

4,200,426

HERMETIC COMPRESSOR ASSEMBLY INCLUDING TORQUE REACTION LEAF SPRING MEANS

Peter J. Linnert, La Crosse, Wis., assignor to The Trane Company, LaCrosse, Wis.

Filed Oct. 26, 1978, Ser. No. 955,034

Int. Cl.[2] F04B *35/04*

U.S. Cl. 417—312 **15 Claims**

1. A hermetic compressor assembly comprising

a. a shell defining an enclosed, hermetically sealed chamber bounded by an interior wall;

b. a compressor disposed within said chamber having a driveshaft extending along a first axis;

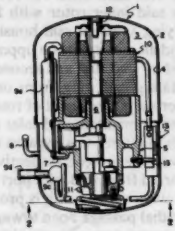
c. suction and discharge conduit means for providing communication between said compressor and the exterior of said chamber;

d. a motor also disposed within said chamber and drivingly connected to said driveshaft, said compressor and motor being united to each other so as to define an integral motor-compressor unit;

e. means for supporting said motorcompressor unit within said chamber so as to permit at least limited rotation about a second axis generally parallel to said first axis; wherein the improvement comprises

f. leaf spring means comprising at least a first leaf spring member affixed at a first end portion thereof to one of said interior wall and said motorcompressor unit and extending therefrom along a first longitudinal axis generally parallel to and spaced radially from said second axis, terminating in a second end portion free for deflection in a direction generally transverse to the plane defined by said second axis and said first longitudinal axis; and

g. abutment means affixed to the other of said interior wall and said motor-compressor unit and disposed adjacent the



second end portion of said leaf spring member whereby, upon rotation of said motor-compressor unit about said second axis, engagement between said abutment means and said second end portion results in deflection of said leaf spring member so as to limit said rotation.

4,200,427

REVERSIBLE GEAR PUMP WITH INVARIANT FLOW DIRECTION

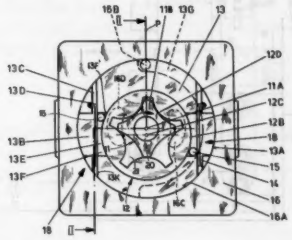
Bernhard Binger, Ravensburg, and Anton Engstler, Friedrichshafen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 19, 1978, Ser. No. 943,617

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1977, 2742821

Int. Cl.[2] F04C *1/06, 15/02*

U.S. Cl. 418—32 **8 Claims**



1. In a gear pump including a housing having a generally cylindrical chamber centered on a first axis, a ring rotatable in said chamber between two limiting positions, said ring having a circular cutout centered on a second axis offset from said first axis, an annular outer rotor centered on said second axis and held in said cutout for free rotation relative to said ring, an inner rotor centered on said first axis within said outer rotor

and provided with a drive shaft for bidirectional rotation by an outside prime mover, said inner rotor being provided with a plurality of external gear teeth, said outer rotor being provided with a number of internal gear teeth exceeding by one the number of said external gear teeth, said internal and external gear teeth meshing with each other for rotary entrainment of said outer rotor by said inner rotor with formation of inter-teeth spaces of varying volume, said housing being provided with an inlet port and an outlet port on opposite sides of a plane of symmetry defined by said first and second axes, and switch-over means for rotating said ring from one of said limiting positions to the other upon a reversal of rotation of said rotors by said prime mover to maintain said inlet and outlet ports in communication with said inter-teeth spaces in zones of increasing and decreasing volume thereof, respectively, whereby fluid is invariably transported from said inlet port to said outlet port,

the improvement wherein said ring is provided with at least one generally radial passage open toward said outer rotor,

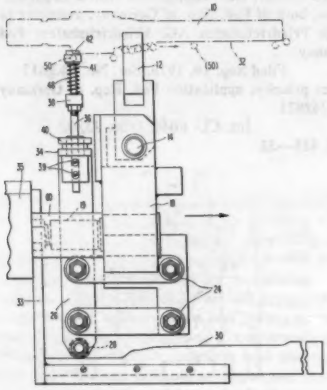
said switchover means comprising a leaf spring spanning said passage near the outer periphery of said outer rotor and defining therewith a wedge-shaped gap diverging symmetrically from a narrow waist to form enlarged lodgments at the ends of said gap, said switchover means further comprising a rotary coupling member in said gap receivable in either of said lodgments but unable to traverse said waist without deformation of said leaf spring, said coupling member occupying the downstream lodgment as seen in the direction of rotation and being displaceable therefrom toward said waist by pressure of leakage fluid present between said ring and said outer rotor upon reversal of rotation of said rotors with resulting frictional entrainment of said ring to its other limiting position and subsequent frictional entrainment of said coupling member by said outer rotor past said waist into the opposite lodgment.

4,200,428

AUTOMATIC MANDREL CHECKER

Karl H. Andrews, Millville, N.J., assignor to Wheaton Industries, Millville, N.J.

Filed May 31, 1978, Ser. No. 911,279
Int. Cl.² B29C *17/07;* B29F *1/14*
U.S. Cl. 425—136 **7 Claims**



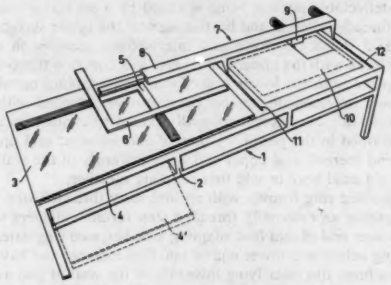
1. Automatic mandrel checker adapted to indicate the presence of foreign material on a generally horizontally extending mandrel having a non-linear profile, said checker consisting of a sensing member urged upwardly to a vertical position along a line corresponding to the bottom edge of the mandrel which said checker is adapted to check, and a sensor member moving means for moving said sensor member generally horizontally and for displacing said sensor member vertically, the resultant path of movement of said sensor member corresponding to the bottom edge contour of said mandrel and means responsive to any interference with said sensor member movement to indicate the presence on said mandrel of foreign material.

4,200,429

DEVICE FOR MAKING RECTANGULAR CUTS, PRINTS AND/OR STAMPINGS

Hans H. Weil, 8 Tullgatan, Malmö, Sweden (S-211 28)

Filed May 10, 1978, Ser. No. 904,536
Int. Cl.² B29C *17/14;* B26D *5/10, 7/26*
U.S. Cl. 425—295 **15 Claims**



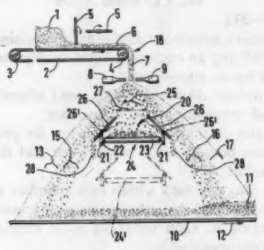
1. A device for making rectangular cuts in a sheet material which comprises four cutting members attached to respective fixtures in a cutting block and wherein each cutting member can be individually moved from an inactive position, in which the cutting member is not in contact with an underlayer of the sheet material to an active position, in which the cutting member is in engagement with the underlayer, the cutting members and fixtures being positioned so that planes of their surfaces coincide with the side faces of a truncated pyramid, and means for defining the direction of motion of the cutting block.

4,200,430

APPARATUS FOR THE MANUFACTURE OF SHEETS

Karl-Heinz Ahrweiler, Krefeld, Fed. Rep. of Germany, assignor to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Jul. 18, 1978, Ser. No. 925,796
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735510
Int. Cl.² B28B *5/00*
U.S. Cl. 425—81.1 **5 Claims**



1. Apparatus for forming a stratified layer, for the manufacture of sheets, from finely divided particles of material exhibiting a size distribution comprising:

(a) means for dispensing particles of the material over a zone of width equal to the width of sheet to be formed, in such a manner so that they fall freely downwardly;

(b) a belt advancing in a forward travel direction disposed below said means for dispensing;

(c) means disposed between said means for dispensing and

said advancing belt, for applying horizontal forces to said particles falling downwardly to impart different motion components parallel to the forward travel direction of the belt to the particles freely falling down depending on the coarseness of the particles and, thereby, to force different parabolic .rajectories thereon; and

(d) means tor sorting out and removing the coarsest particles before they strike the belt, whereby because of said different parabolic trajectories a stratified layer will be formed on said belt.

4,200,431

ROLLER, PARTICULARLY FOR A ROLLER HEARTH FURNACE

Rüdiger Knaak, Neuss, Fed. Rep. of Germany, assignor to Koppers-Wistra Offenbau GmbH, Dusseldorf-Heerdt, Fed. Rep. of Germany

Filed May 22, 1978, Ser. No. 908,248

Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722937

Int. Cl.[2] **F27B** *9/20*

U.S. Cl. 432—236 **81 Claims**

1. A roller, particularly for a roller hearth furnace for heating materials to high temperatures, comprising a supporting body defining a roller axis and having a curved center line and a cross-section substantially normal to said center line, said supporting body including a plurality of portions which are connected with one another and radially surround said roller axis in spaced relationship therewith, said portions extending in a circumferential direction and being positioned at axially

spaced locations relative to one another so that a periphery of the roller is materially formed only at locations corresponding to said axially spaced locations of said portions and the roller has a plurality of empty regions between said locations.

4,200,432

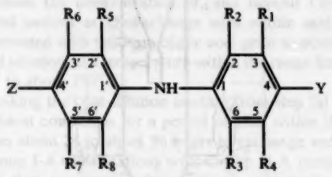
DYE COMPOSITION CONTAINING OXIDATION DYE AND DIPHENYLAMINE

Gregoire Kalopissis, Neuilly-sur-Seine; Andree Bugaut, Boulogne-Billancourt, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation-in-part of Ser. No. 551,637, Feb. 21, 1975, abandoned. This application Nov. 21, 1977, Ser. No. 853,813
Claims priority, application Luxembourg, Feb. 22, 1974, 69458
Int. Cl.[2] A61K 7/13
U.S. Cl. 8—10.2 34 Claims

1. A hair dye composition in the form of an aqueous or hydroalcoholic solution, a cream, an emulsion, a dispersion or an aerosol comprising an oxidation dye and a diphenylamine selected from the group consisting of

(i) a diphenylamine of the formula



wherein

R_1 and R_4 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms, lower alkoxy having 1–6 carbon atoms, acetylamino and ureido;

R_2 and R_3 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms, lower alkoxy having 1–6 carbon atoms, amino, N-alkylamino wherein the alkyl moiety has 1–6 carbon atoms, N-hydroxyalkylamino wherein the alkyl moiety has 1–6 carbon atoms, acetylamino, N-carbamylalkylamino wherein the alkyl moiety has 1–6 carbon atoms and ureido;

R_5 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms;

R_6, R_7 and R_8, each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms;

Y represents a member selected from the group consisting of hydroxy and amino; and

Z represents a member selected from the group consisting of hydroxy and

wherein

R_9 and R_{10} each independently represent a member selected from the group consisting of hydrogen, lower alkyl containing 1–6 carbon atoms, hydroxyalkyl containing 1–6 carbon atoms, carbamyl alkyl wherein the alkyl moiety has 1–6 carbon atoms, amino alkyl wherein the alkyl moiety has 1–6 carbon atoms, monoalkylamino alkyl wherein each of the alkyl moieties has 1–6 carbon atoms, dialkylamino alkyl wherein each of the alkyl moieties has 1–6 carbon atoms, acylaminoalkyl wherein the alkyl moiety has 1–6 carbon atoms, alkylsulfonamido alkyl wherein each of the alkyl moieties has 1–6 carbon atoms, arylsulfonamidoalkyl wherein the alkyl moiety has 1–6 carbon atoms, sulfoalkyl wherein the alkyl moiety has 1–6 carbon atoms and piperidinoalkyl wherein the alkyl moiety has 1–6 carbon atoms, with the proviso that R_2 and R_3 are other than amino or acetylamino (1) when (a) Z is OH, (b) Y is amino and (c) each of R_1 and R_4 is hydrogen or alkyl or (2) when (d) Z is OH, (e) Y is amino, (f) R_1 or R_4 is alkoxy, and (g) each of R_5, R_6, R_7 and R_8 is hydrogen, alkyl or halogen, one of R_5, R_6, R_7 and R_8 being other than hydrogen, or

(ii) a salt of the diphenylamine of (i), said diphenylamine and said oxidation dye being present in a tinctorially effective amount.

4,200,433

USE OF NICKEL PHENOLATE OF O,O'-BIS(P-1,1,3,3-TETRAMETHYLBUTYLPHENOL)-SULFONE AND A PHOSPHITE IN DYEING POLYOLEFINS

Robert J. Tucker, Hackettstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sep. 1, 1978, Ser. No. 939,018
Int. Cl.[2] C09B 45/00; D06P 1/10
U.S. Cl. 8—42 D 14 Claims

1. A dyeable olefinic polymer composition comprising an olefinic polymer, about 0.7 to 4% by weight of the reaction product of about 50 to 90% by weight of the full nickel phenolate of o,o'-bis(p-1,1,3,3-tetramethylbutylphenol)sulfone, and about 50 to 10% by weight of a secondary or tertiary organic phosphite.

4,200,434

IMMUNOLOGICAL BLOOD TEST METHOD

Kazuo Okochi, and Hiroyuki Kiyokawa, both of Fukuoka, Japan, assignors to Sanki Engineering Ltd., Nagaokakyo, Japan

Filed Feb. 24, 1978, Ser. No. 881,051
Claims priority, application Japan, Feb. 24, 1977, 52/19614
Int. Cl.[2] G01N 33/16
U.S. Cl. 23—230 B 5 Claims

1. An immunoassay for detecting a particular antibody in a blood sample, said antibody being associated with the erythrocytes in the blood as antibody-sensitized erythrocytes comprising:

(a) contacting the erythrocytes with an antigen immunologically corresponding to said antibody,

(b) introducing the antigen-contacted erythrocytes into a liquid solution of a polymer compound, said liquid solution being contained in a coil comprising a transparent tube helically wound on a support rod,

(c) subjecting the contents of the coil to a centrifugal field produced by simultaneously rotating and revolving the coil,

(d) measuring the erythrocytes sedimentation rate; and

(e) correlating the rate of erythrocyte sedimentation to any presence of said particular antibody.

4,200,435

DETERMINATION OF GLYCOSYLATED HEMOGLOBIN IN BLOOD

Stephen D. Stroupe, and Edwin G. Moore, both of Libertyville, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 26, 1978, Ser. No. 973,368
Int. Cl.[2] G01N 33/16, 21/00
U.S. Cl. 23—230 B 6 Claims

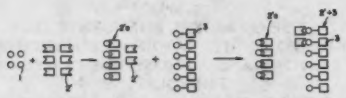
1. A method for determining glycosylated hemoglobin in a blood sample comprising chemically or physically treating the blood sample to release glycosylated and non-glycosylated hemoglobins from red blood cells, intermixing an allosteric effector site binding substance which binds to the allosteric effector site of the non-glycosylated hemoglobin thereby changing the distribution between allosteric forms of the hemoglobins, and measuring the change.

4,200,436

IMMUNOCHEMICAL MEASURING PROCESS

Ei Mochida, Tokyo; Nobuhisa Ogawa, Omiya; Hiroyuki Shinkai, Kawagoe, and Masakatsu Hashimoto, Tokyo, all of Japan, assignors to Mochida Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1977, Ser. No. 837,434
Claims priority, application Japan, Sep. 30, 1976, 51-117621
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 7 Claims



1. Immunochemical measuring process comprising the steps of

(a) reacting an antigen to be measured with labeled monovalent antibody obtained by bonding a labeling agent to an antibody which makes a monovalent bond to the antigen,

(b) reacting insolubilized antigen obtained by insolubilizing the same antigen as that to be measured, with the reaction mixture produced in step (a),

(c) separating the reaction mixture of step (b) into a solid phase and a liquid phase, and

(d) measuring the activity of the labeling agent of the solid phase or liquid phase separated in step (c).

4,200,437

METHOD FOR THE MANUFACTURE OF MATCHES

Michael G. C. Cox, Slough, England, assignor to Wilkinson Sword Limited, Buckinghamshire, England

Filed Feb. 23, 1979, Ser. No. 14,271
Int. Cl.[2] C06F *3/00, 3/02, 5/00*
U.S. Cl. 44—42 9 Claims

1. In a method for the manufacture of matches which comprises applying to a match splint a head of a composition ignitable by friction on a surface and a solid, low melting point fuel, the improvement which comprises applying the fuel to the splint by coating the splint, before formation of the head thereon, with an aqueous dispersion containing (i) the fuel dispersed in the aqueous phase, (ii) a finely divided, particulate or fibrous filler, and (iii) a water-immiscible volatile solvent for the fuel, and drying the coated splint to deposit therein a surface coating comprising a mixture of said fuel and the finely divided filler.

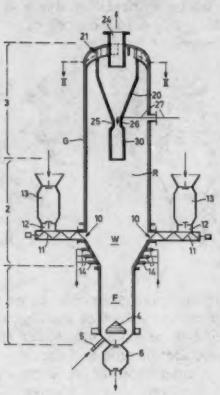
9. A match comprising a splint, a combustible head formed from a match head composition ignitable by striking said head on a surface and a solid low melting point fuel, wherein the fuel is provided on said splint by coating the splint, before formation of the head thereon, with an aqueous dispersion containing (i) the fuel dispersed in the aqueous phase, (ii) a finely divided, particulate or fibrous filler, and (iii) a water-immiscible volatile solvent for the fuel, and drying the coated splint to deposit therein a surface coating comprising a mixture of said fuel and the finely divided filler.

4,200,438

GASIFICATION OF SOLID FUEL

Walter Kaimann, Rietberg, and Karl-Heinz Brachthauser, Ratingen, both of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik GmbH, Ratingen, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,367
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742222
Int. Cl.[2] C10J *3/20*
U.S. Cl. 48—73 12 Claims



1. A method of producing gas from solid fuel, comprising: gasifying solid fuel with a gasifying medium in a fluidised bed in a single reaction chamber; separating solid particles out from the gas rising from the fluidised bed by centrifugal force in a cyclone arranged within said chamber and above said fluidised bed having an outlet axially aligned with said reaction chamber; gasifying the separated particles immediately downstream of said outlet in a co-current separate stream of gasifying medium in a gasification chamber disposed below said outlet, whereby the particles are gasified separately from the fluidised bed; and allowing the molten reaction products of said separated particles to stream directly into said fluidised bed.

3. A generator for producing gas from solid fuel, comprising a generator vessel defining a single reaction chamber which contains a fluidised bed gasification zone, said vessel having an uppermost portion, means for feeding solid fuel into the reaction chamber, means for feeding a gasifying medium into the fluidized bed gasification zone, a cyclone arranged within said vessel and above the fluidised bed gasification zone for separating solid particles from the gas rising from the said zone having an outlet for said separated particles axially aligned with said chamber, a gasification chamber connected to said outlet immediately downstream of and below the cyclone above said fluidised bed so as to receive the separated particles, and an injector operatively associated with said gasification chamber for supplying a stream of gasifying medium to the gasification chamber co-currently with the flow of the separated particles, said gasification chamber opening towards said reaction chamber containing said fluidised bed gasification zone for directly streaming the molten reaction products thereinto.

4,200,439

GASIFICATION PROCESS USING ION-EXCHANGED COAL

Robert J. Lang, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 19, 1977, Ser. No. 861,826
Int. Cl.[2] C10J 3/00, 3/54
U.S. Cl. 48—210 17 Claims

1. A process for gasifying coal to produce a fuel gas which comprises:

(a) contacting said coal for a period of time within the range from about 0.1 to about 48 hours with a solution of an admixture of compounds, inclusive of a soluble Group I-A metal salt and an excess of Group II-A metal hydroxide added initially to the solution, each of which interacts one with the other to form a Group I-A metal hydroxide, and an insoluble Group II-A salt precipitate, sufficient to increase the concentration of, and deposit Group I-A metal cations at ion-exchange sites within said coal as contrasted with the state of the coal prior to contact with said solution, at a temperature within the range from about 20° to about 250° F.;

(b) soaking the coal-solution mixture from step (a) at about ambient conditions for a period of time within the range from about 24 to about 96 hours to exchange and replace Group I-A metal cations with Group II-A metal cations and then evaporating the solution to physically disperse the Group I-A metal compounds onto the ion-exchanged coal, and

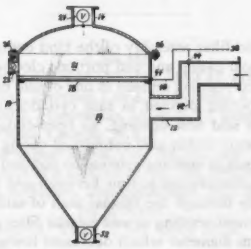
(c) gasifying the treated coal at gasification conditions in a gasification zone to produce fuel gas.

4,200,440

FILTER CONSTRUCTION

Ronald J. Renko, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Feb. 21, 1979, Ser. No. 12,988
Int. Cl.[2] B03C 3/12, 3/62
U.S. Cl. 55—131 6 Claims



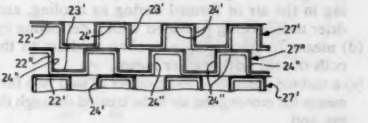
1. Apparatus for filtering particulate matter from a gas stream including a housing enclosing a filter compartment and having an inlet port for gas to be filtered and an outlet port for the exhaust of clean gas therefrom, filter means extending across said housing intermediate the inlet and outlet ports adapted to intercept the particulate matter and divide said filter compartment into inlet and outlet chambers, a porous ceramic support lying in said outlet chamber laterally adjacent the filter means, a metallic surface on said ceramic support, a discharge electrode adjacent said inlet adapted to subject particulate matter traversing the inlet to electrostatic discharge from said electrode, and means for applying a similar electric charge to the metallic surface and to said discharge electrode whereby the particulate matter is repulsed from the porous filter support while clean gas is permitted to flow therethrough.

4,200,441

REGENERATIVE HEAT EXCHANGER

Winfried Hönmann, and Gerd E. Schaal, both of Stuttgart, Fed. Rep. of Germany, assignors to LTG Lufttechnische GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1977, Ser. No. 811,412
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1976, 2629120; Feb. 14, 1977, 2706139
Int. Cl.[2] B01D 53/26
U.S. Cl. 55—181 21 Claims



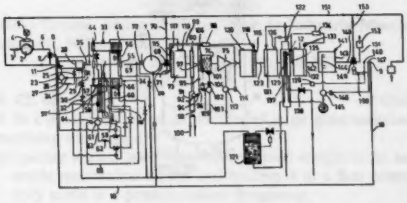
1. A regenerative heat exchanger comprising a rotor having a heat storage mass consisting at least substantially of two superimposed corrugated strip layers each having a plurality of longitudinally spaced transverse channels open alternatingly in opposite directions and having a maximum length extending between the side edges of said strip layers, said two corrugated strip layers being wound convolutely about the axis of rotation of said rotor in a plurality of plies and means for simultaneously directing separate gas streams through different parts of the rotor, whereby on rotation of the rotor the storage mass effects the exchange of sensible heat and/or moisture heat between the streams, the heat storage mass being formed by adjacent corrugated strip layers provided with transverse channels having a longitudinal direction, said transverse channels of said two corrugated strip layers being inclined in opposite directions to the longitudinal direction of said corrugated strip layers with the open transverse channels of maximum length of one of said corrugated strip layers arranged to span between two to six transverse channels of the other corrugated strip layer which are open towards it.

4,200,442

APPARATUS FOR NEUTRALIZING AND PURIFYING AIR

Henri A. Willot, Sart-Dames-Avelines, Belgium, assignor to Centre de Recherche Fondamentale "Rivieren" S.P.R.L., Brussels, Belgium

Filed Dec. 2, 1977, Ser. No. 856,951
Claims priority, application United Kingdom, Dec. 3, 1976, 50617/76; Belgium, May 3, 1977, 177240
Int. Cl.[2] B01D 45/04, 50/00; F25D 17/06
U.S. Cl. 55—222 21 Claims



1. Apparatus for neutralizing and purifying air, comprising, in succession:

(a) rotary air filter means for removing particles from the air to be treated, said rotary filter means having an inlet for receiving air to be treated and an outlet,

(b) a preliminary drier means comprising a cooling tunnel having an inlet connected to the outlet of said rotary air filter means to receive air filtered by said rotary air filter

means and through which the filtered air passes to an outlet of said preliminary drier means and including a refrigeration coil followed by a plurality of deflectors for partially removing liquid particles and droplets in the air formed by its cooling to their dew point,

(c) two further drier means connected to said outlet of said preliminary drier means to receive air from the preliminary drier means and which are alternately operable, each having a cooling tunnel through which the predried air passes and comprising a cooling coil for cooling the air to a temperature of from −20° to −40° C. followed in the direction of air flow by a plurality of deflectors for completely removing any liquid droplets and particles remaining in the air or formed during its cooling, each further drier means being provided with a defrosting system,

(d) means for providing a cooling medium to the cooling coils of said further drier means,

(e) a turbine connected to an outlet of said two further drier means for moving the air to be treated through the apparatus, and

(f) a cooling unit means connected to an outlet of said turbine for receiving the dried air from the further drier means and comprising, in order in the direction of air flow, heat exchanger means cooperating with refrigeration machine means to cool the dried air, separator means for separating droplets and particles of liquefied gas formed during the cooling of the dry air, separator means for separating solid particles existing or formed during the same cooling of said dry air, and further heat exchanger means for reheating the dry and treated air to the inlet temperature of the first recited heat exchanger means.

4,200,443

VERTICAL SEPARATOR FOR SEPARATING A MIXTURE OF FLUID PHASES

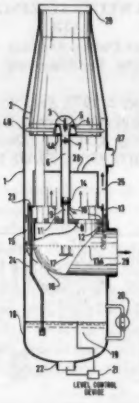
Jacques Marjollet, Paris; Gerard Tondeur, Velizy Villacoublay; Jean-Pierre Cerdan, Houilles, and Patrick Talleu, Chatou, all of France, assignors to Stein Industrie, Paris, France

Filed Oct. 27, 1978, Ser. No. 955,237

Claims priority, application France, Nov. 30, 1977, 77 36095

Int. Cl.[2] B01D *45/12*

U.S. Cl. 55—347 **5 Claims**



1. A vertical separator for separating respective liquid and vapor phases of a fluid mixture, said separator including: an outer casing, said outer casing having disposed therein, an upper sleeve enclosing an inlet chamber for the fluid mixture, a plurality of vertical tubes, said tubes being provided with inlet openings at the top of said tubes, communicating with said inlet chamber, and fixed vanes positioned in said tubes to urge the mixture to flow helically; at the bottom of said coaxial tubes of smaller diameter for the collection of dry steam, fixed on a perforated disc and communicating with a dry steam collection chamber, inside of an inner casing and connected with a dry steam outlet tube, said coaxial tubes having annular spaces between them and the bottom of said vertical tubes for the removal of a fluid mixture with increased liquid content; a cylindrical casing enclosing a free space around said plurality of vertical tubes above said perforated disc, said free space allowing the separation of said fluid mixture with increased liquid content into substantially dry vapor and a liquid still containing some vapor, said cylindrical casing being spaced from the inner side of said outer casing to thereby define an outer annular space, from the periphery of said inner casing of said dry steam collection chamber defining an inner annular space for the downwards flow of said liquid still containing some vapor, and being provided with a lower free edge for allowing the vapor remaining in said liquid still containing some vapor to escape upwardly through said outer annular space, means for withdrawing said substantially dry vapor and said escaped vapor, and means for collecting and withdrawing the liquid stripped from said escaped vapor.

4,200,444

FILTERS

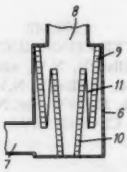
Stanley P. Witchell, Abergavenny, England, assignor to Engineering Components Limited, England

Filed Mar. 14, 1975, Ser. No. 558,496

Claims priority, application United Kingdom, Mar. 29, 1974, 13985/74; Mar. 29, 1974, 13986/74; Dec. 31, 1974, 56090/74

Int. Cl.[2] B01D *46/02*

U.S. Cl. 55—484 **4 Claims**



1. In a fluid filter assembly of the kind comprising a generally cylindrical casing and end portions closing opposite ends thereof, a first opening defined in one of said end portions and a second opening defined in said cylindrical casing axially remote from said first opening, an open-ended tubular filter element located within said cylindrical casing with filter element open ends in abutting relation to said end portion so that in use fluid is constrained to flow between said first and second openings only through the tubular wall of said filter element, the improvement residing in said tubular filter element having a non-uniform diameter which decreases towards said second opening axially of said filter element from the open end thereof abutting said one end portion surrounding said first opening wherein the external diameter of the filter element closely approaches the internal diameter of the cylindrical casing, and said first opening has a diameter substantially equal to the internal diameter of said filter element thereat, the further improvement wherein said filter element comprises first and second tubular parts of different diameters extending from said end portions into partly overlapping relation and defining a channel between their overlapped regions, and an impermeable member joining the overlapped free ends of said tubular parts and preventing communication between said first and second openings through said channel.

2. In a fluid filter assembly of the kind comprising a generally cylindrical casing and end portions closing opposite ends thereof, a first opening defined in one of said end portions and a second opening defined in said cylindrical casing axially

remote from said first opening, an open-ended tubular filter element located within said cylindrical casing with filter element open ends in abutting relation to said end portions so that in use fluid constrained to flow between said first and second openings only through the tubular wall of said filter element, the improvement residing in said tubular filter element having a non-uniform diameter which decreases towards said second opening axially of said filter element from the open end thereof abutting said one end portion surrounding said first opening whereat the external diameter of the filter element closely approaches the internal diameter of the cylindrical casing, and said first opening has a diameter substantially equal to the internal diameter of said filter element thereat, the further improvement wherein said filter element diameter decreases stepwise axially of said filter element, and an impermeable member is provided at each step to prevent communication between said first and second openings thereat.

3. In a fluid filter assembly of the kind comprising a generally cylindrical casing and end portions closing opposite ends thereof, a first opening defined in one of said end portions and a second opening defined in said cylindrical casing axially remote from said first opening, an open-ended tubular filter element located within said cylindrical casing with filter element open ends in abutting relation to said end portions so that in use fluid is constrained to flow between said first and second openings only through the tubular wall of said filter element, the improvement residing in said tubular filter element having a non-uniform diameter which decreases towards said second opening axially of said filter element from the open end thereof abutting said one end portion surrounding said first opening wherein the external diameter of the filter element closely approaches the internal diameter of the cylindrical casing, and said first opening has a diameter substantially equal to the internal diameter of said filter element thereat, the further improvement wherein said filter element is in the form of two truncated cones each having a base region and an apex region, said base regions being in abutting relating to said end portions from which they extend, said apex regions being contiguous, and a fluid tight joint between said apex regions, said second opening being located in said cylindrical casing adjacent said joint between said apex regions.

4,200,445

METHOD OF DENSIFYING METAL OXIDES

Peter P. Bihuniak, Corning; Lewis H. Brandes, Campbell, and Donald L. Guile, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 791,931, Apr. 28, 1977, abandoned, which is a division of Ser. No. 680,061, Apr. 26, 1976, Pat. No. 4,042,361. This application Apr. 10, 1978, Ser. No. 895,140

Int. Cl.[2] C03B *23/20*; C01B *33/32*

U.S. Cl. 65—18 **3 Claims**

1. A method for producing glassy granules of high silica glass (>70% by weight SiO_2) containing at least one metal oxide from Groups III and IV of the Periodic Table selected from the group of Al_2O_3, B_2O_3, GeO_2, HfO_2, ZrO_2, and TiO_2 which consists of the steps:

(a) a silica-producing component and said Group III and/or Group IV metal oxide-producing component are passed through a flame burner to form a composite fumed product of uniform composition;

(b) said composite fumed product is mixed with a polar liquid to form a flowable sol containing up to 45% solids content;

(c) said polar liquid is removed from said sol to produce a fragmented solid; and then

(d) said fragmented solid is calcined within the temperature range of 1150°-1500° C. to produce glassy granules.

4,200,446

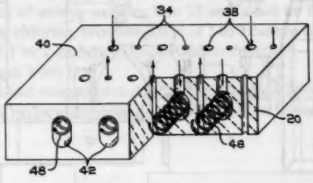
GAS HEARTH ELECTRICAL HEATING SUPPLEMENT AND METHOD OF OPERATION

Harry S. Koontz, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 29, 1979, Ser. No. 7,124

Int. Cl.[2] C03B *29/04*

U.S. Cl. 65—25 A **9 Claims**



1. In a furnace for heating a sheet of glass while supported on a layer of gas comprising a gas hearth block, a plurality of gas supply passages extending through said gas hearth block and means to supply pressurized gas through said gas supply passages to an upper surface of said block to supply sufficient gas through said gas supply passages to said upper surface of said gas hearth block to provide said layer of gas on said upper surface, and a plurality of exhaust passages extending from said upper surface through said block to an exhaust region to exhaust excess gas through said gas hearth block to said exhaust region,

the improvement comprising electric heating wire supported within at least some of said passages in position to heat gas moving therethrough with minimum interference to the movement of said gas through said passages containing said electric heating wire, and a voltage source adapted to be connected to said electric heating wire to supply electric current to said electric heating wire.

6. In the method of heating and supporting a glass sheet by the gas hearth method in which hot gas is delivered under pressure to the upper surface of a gas hearth bed through gas supply passages within said bed at a rate sufficient to provide a layer of gas on said upper surface sufficient to support said glass sheet thereon and then excess of said gas is exhausted from said upper surface via exhaust passages within said bed,

the improvement comprising electrically heating said gas within at least some of said passages while simultaneously electrically heating said gas hearth bed from within at least some of said passages.

4,200,447

PROCESS FOR THE PRODUCTION OF LARGE GLASS CONTAINERS

Antonio Cruccu, Milan, Italy, assignor to Industria Macchine Impianti, Milan, Italy

Filed Feb. 16, 1978, Ser. No. 878,543

Int. Cl.[2] C03B *9/14*

U.S. Cl. 65—76 **3 Claims**

1. In a process for the manufacture of large glass containers, comprising the steps of:

preparing a glass gob of a predetermined weight in an automatic mechanical feeder and feeding it to a first preparatory mold at a predetermined frequency;

forming a parison in the preparatory mold, at the same frequency, the parison comprising a finished mouth of the glass container to be formed;

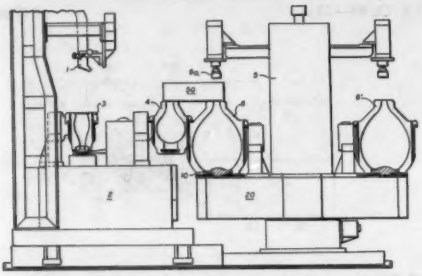
linearly transferring the parison to a second, prefinishing mold, and forming at the same frequency, a prefinished parison;

and transferring the prefinished parison to one of two to four finishing molds and finishing same therein by blowing air into the prefinished parison;

the improvement comprising

a. continuously rotating the finishing molds in a circular path at a rotational speed in a ratio of from 1:2 to 1:4 to the predetermined frequency; and

b. transferring the prefinished parison from the second mold to a finishing mold along a path substantially



diametrical to the circular path and at the predetermined frequency;

whereby two to four finishing molds are utilized for each first and second mold when the finishing molds are rotated at the appropriate ratio with respect to the predetermined transfer frequency.

4,200,448

GLASS MANUFACTURE

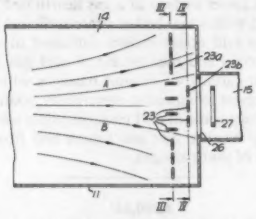
George A. Dickinson, St. Helens, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed May 19, 1978, Ser. No. 907,776

Claims priority, application United Kingdom, Jun. 3, 1977, 23699/77

Int. Cl.[2] C03B 5/22

U.S. Cl. 65—134 **4 Claims**



1. A method of producing molten glass comprising feeding glass forming materials into an inlet end of a glass melting tank having confining wall surfaces, a bottom and an outlet end, melting the material in a melting zone of the tank adjacent the inlet end of the tank, refining the molten material at a position downstream of the melting zone, stirring the molten material flowing towards the outlet end of the tank by a plurality of stirrers that are spaced laterally apart across the tank and which are capable of extracting heat from the molten glass, and conditioning the molten glass adjacent the outlet end of the tank so that the molten glass is ready for use in a forming process, said method further comprising providing temperature gradients in the contents of the tank so as to cause the forward flow of molten glass towards said outlet end of the tank and a return flow of molten glass toward said inlet end of the tank, said return flow further being initiated by flow towards the wall surfaces and flow towards the bottom of the melting tank, wherein the amount of heat extracted by the stirrers from the glass flowing therethrough is such that less heat is extracted from the molten glass which constitutes the return flow of molten glass than is extracted from the molten glass which continues forward to said outlet end.

4,200,449

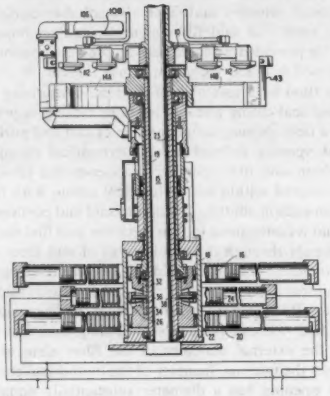
APPARATUS FOR BLOW MOLDING HOLLOW GLASSWARE

John K. Martin, Monterrey, Mexico, assignor to Investigacion FIC Fideicomiso, Monterrey, Mexico

Filed Apr. 20, 1978, Ser. No. 898,080

Int. Cl.[2] C03B 9/00, 9/14

U.S. Cl. 65—229 **20 Claims**



1. A blow molding machine for the manufacture of hollow glass articles comprising:

a base;

at least one neck ring arm mounted on said base for rotation in a horizontal plane in opposite directions to position opposite ends of said arm alternately in molding and takeout positions 180 degrees apart, said arm having at least two rotatable neck rings, at least one on each side of and spaced equally from the axis of rotation of said arm;

at least a pair of two-piece blow molds and mold carriers mounted on said base below said arm one on each side of the axis of rotation of said arm for rotation therewith on the same axis, said mold carriers being so interconnected that one mold is closed when the other is opened, said molds when closed being in axial alignment with respective neck rings on that side of said arm;

at least one parison mold and cooperating plunger means carried by said base and operating in timed relation to movements of said arm for forming a preform supported by one of said neck rings when either end of said arm is locked in said molding position and the corresponding blow mold is opened;

means for closing the opened blow mold on said preform while simultaneously opening the other of said blow molds while said arm remains stationary;

means for blowing said preform into final shape in said closed blow molds while said arm remains stationary;

means for simultaneously rotating said arm, molds and blowing means 180 degrees while continuing blowing to cool the ware in the closed mold;

means operable during rotation of said arm and molds and during the entire time that a blow mold is open for spray cooling and moistening the open blow mold to ready it for the next perform; and

means for opening the closed mold from the finished cooled ware to release the ware to a takeout means and simultaneously closing the cooled and moistened blow mold around the next preform.

11. A blow molding multiple-section machine for the manufacture of hollow glass ware comprising:

a common base and at least one vertical shaft carried by said base;

at least one neck ring arm mounted at a point between the ends thereof on said vertical shaft for oscillating movement in a horizontal plane;

means for moving said neck ring arm to position opposite ends of said arm alternately to molding and takeout positions 180 degrees apart, said neck ring arm having at least two rotatable neck rings, at least one on each side of the axis of oscillation of said neck ring arm;

an articulated two-part blow mold carrier pivoted on said base below said neck ring arm on one side of the axis of oscillation, said blow mold carrier having at least one two-piece facing blow mold when in one position and another two-piece blow mold adapted to assume facing position when the blow mold carrier is moved 180 degrees, said blow mold carrier being so interconnected that one blow mold is closed when the other is open, said blow molds when closed being in axial alignment with respective neck rings on that side of said neck ring arm;

at least one parison mold and cooperating plunger means carried by said base and operating in timed relation to movements of said neck ring arm for forming a preform supported by one of said neck rings when either end of said neck ring arm is in said molding position and the corresponding blow mold is open;

means for closing the open blow mold on said preform while simultaneously opening the other of said blow molds while said neck ring arm remains stationary;

means for blowing said preform into final shape in said closed blow molds while said arm remains stationary;

means for simultaneously oscillating said neck ring arm and mold carrier 180 degrees while continuing blowing to cool the glass ware in the closed blow means;

means operable during oscillation of said neck ring arm and mold carrier for spray cooling the open blow mold to prepare it for the next preform; and

means for opening the closed blow mold from the finished cooled glass ware and releasing the glass ware to a takeout means and simultaneously closing the cooled blow mold around the next preform.

4,200,450

N-ALKYL OR ALKOXY-N'-SUBSTITUTED HYDROCARBYL UREA

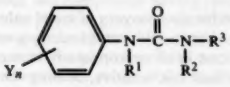
Malcolm S. Singer, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 741,422, Nov. 12, 1976, Pat. No. 4,111,683, which is a continuation-in-part of Ser. No. 591,058, Jun. 27, 1975, abandoned, which is a continuation of Ser. No. 385,521, Aug. 3, 1973, abandoned, which is a continuation-in-part of Ser. No. 124,422, Mar. 16, 1971, abandoned, and Ser. No. 124,423, Mar. 16, 1971, abandoned. This application Jun. 26, 1978, Ser. No. 919,016

Int. Cl.[2] A01N *9/24*

U.S. Cl. 71—106 **9 Claims**

1. A compound of the formula

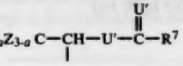


wherein

R^1 is hydrogen or alkyl of 1 to 4 carbon atoms;

R^2 is alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms;

R^3 is the group



wherein R^7 is an amino group optionally substituted with 1 to 2 alkyl groups individually of 1 to 4 carbon atoms, U' is O or S, R^4 is hydrogen or CW_3', W' and Z are hydrogen or halogen of atomic number 9 to 35 and a is 0 or 1;

Y is fluorine, chlorine, bromine, alkyl of 1 to 2 carbon atoms, alkoxy of 1 to 2 carbon atoms or trifluoromethyl;

n is an integer from 0 to 5.

7. An herbicidal composition comprising a biologically inert carrier and an herbicidally effective amount of the compound of claim 1.

4,200,451

PLANT GROWTH REGULATING AGENT

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

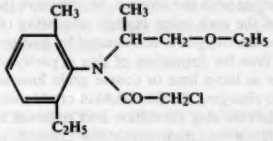
Continuation of Ser. No. 812,035, Jul. 1, 1977, abandoned, which is a continuation-in-part of Ser. No. 678,584, Apr. 20, 1976, abandoned, which is a continuation-in-part of Ser. No. 512,285, Oct. 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 366,955, Jun. 4, 1973, abandoned. This application Aug. 15, 1978, Ser. No. 933,687

Claims priority, application Switzerland, Jun. 6, 1972, 8345/72; Mar. 30, 1973, 4607/73

Int. Cl.[2] A01N *9/20, 5/00*; C07C *103/375*

U.S. Cl. 71—118 **4 Claims**

1. The compound 2-ethyl-6-methyl-N-(1'-ethoxyprop-2'-yl)-N-chloroacetanilide of the formula



4,200,452

METHOD FOR THE REFINING OF IRON-BASED MELTS

Peter H. Savov; Vassil G. Peev; Alexander Y. Valchev, and Nikola A. Lingorski, all of Sofia, Bulgaria, assignors to DSO "Cherna Metalurgia", Sofia, Bulgaria

Filed Jun. 29, 1978, Ser. No. 920,273

Claims priority, application Bulgaria, Jul. 1, 1977, 36772

Int. Cl.[2] C21C *5/52, 7/10*

U.S. Cl. 75—12 **3 Claims**

1. A method of refining a ferrous melt, comprising the steps of:

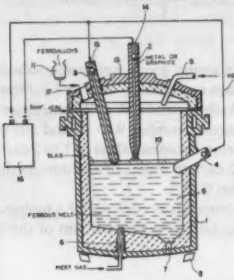
(a) introducing the ferrous melt into a ladle;

(b) applying and sealing a cover to said ladle;

(c) introducing a stirring gas into the melt in said ladle through a porous plug in the base of said ladle;

(d) heating the melt in said ladle by passing a direct electric current through said melt between two electrodes in contact therewith and by additionally generating an arc

with direct current between another electrode spaced from above the melt; and



(e) introducing a gas into said melt through at least one of said electrodes.

4,200,453

PROCESS FOR THE PRODUCTION OF NICKEL ALLOYS

John A. Hatzinicolaides, and Demetrios C. Papamantellos, both of Athens, Greece, assignors to Larco, Societe Miniere et Metallurgique de Larymna S.A., Athens, Greece and Eisenwerk-Gesellschaft Maximilianshutte m.b.H., Rosenberg, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 944,080

Claims priority, application Greece, Oct. 29, 1977, 54662

Int. Cl.[2] C21C *5/34*

U.S. Cl. 75—52 **8 Claims**

1. In a process for the production of a nickel alloy having a maximum sulfur content of 0.05% in a converter, by treatment of a crude ferro-nickel melt having a sulfur content of about 10% to about 0.50% with oxygen and lime to form a slag and removal of the slag, the improvement which comprises introducing at least a part of the required amount of lime as lime powder, together with the oxygen, by injection tuyeres under the surface of the melt using tuyeres consisting of concentric pipes wherein the oxygen is surrounded by hydrocarbons, and wherein the lime for formation of slag is partly charged into the converter as lump lime or coarse grain lime ad preheated there prior to charging the ferro-nickel crude metal, whereby a maximum of two slag formation and removal treatments is required to obtain said maximum sulfur content.

4,200,454

PROCESS FOR THE VOLATILIZATION OF ZINC AND/OR LEAD FROM METALLURGICAL MATERIAL

Carl-August Maelzer, Prien, Chiemsee; Martin Rahn, Frankfurt am Main; Lothar Reh, Bergen-Enkheim; Bernd Thone, Friedberg; Karel Vydra, Bad Nauheim, all of Fed. Rep. of Germany, and David Rice, R. D. 1. Industry, Pa., assignors to Metallgesellschaft AG, Frankfurt am Main, Fed. Rep. of Germany and St. Joe Minerals Corporation, New York, N.Y.

Filed Mar. 31, 1978, Ser. No. 892,259

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1977, 2716084

Int. Cl.[2] C22B *19/20, 19/04*

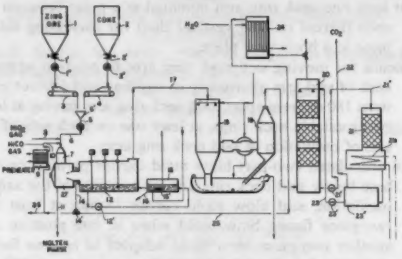
U.S. Cl. 75—88 **19 Claims**

1. A process for the production of zinc, comprising the steps of:

(a) reacting a zinc-containing oxide metallurgical material, a carbonaceous substance, and a high-oxygen gas in a cyclone chamber having an axis oriented from the horizontal to an angle up to 15° with the horizontal, at a temperature above 1300° C., thereby evaporating zinc and producing an exhaust gas stream containing carbon monoxide and carbon dioxide, the vaporized zinc being entrained in said exhaust gas stream;

(b) condensing zinc from said exhaust gas and discharging at least most of the condensed zinc from the process;

(c) removing carbon dioxide from said exhaust gas after the



condensation of the zinc therefrom, thereby producing a high carbon monoxide gas;

(d) recycling most of said high carbon monoxide gas to at least one of steps (a) and (b).

4,200,455

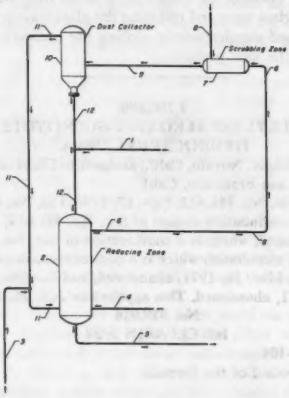
HYDROMETALLURGICAL RECOVERY OF METAL VALUES

James A. Bradbury, Tucson, Ark.; John C. Stauter, Edmond, Okla.; Richard T. Um, Tucson, Ark.; Frank A. Stephens, Tucson, Ark., and Yoon T. Auck, Tucson, Ark., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 18, 1978, Ser. No. 952,503

Int. Cl.[2] C22B *15/10, 23/04*

U.S. Cl. 75—91 **12 Claims**



1. In a process for the recovery of metal values from a metal bearing source wherein said metal bearing source is subjected to a reductive roast in an appropriate reducing atmosphere in contact with at least one additive, cooling the reduced metal bearing source, extracting the cooled reduced metal bearing source, and recovering the resultant metal value, the improvement which comprises dry scrubbing the off-gas stream from said reductive roast with fresh metal bearing source to remove additive from said stream, and supplying the resultant additive-containing fresh metal bearing source to said reductive roast.

4,200,456

METHOD OF AND MEMBER FOR ADDING TREATING AGENT FOR MOLTEN METAL

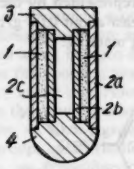
Kenji Fujii, Nishinomiya, Japan, assignor to Yoshida Iron Works Co. Ltd, Hyogo, Japan

Continuation-in-part of Ser. No. 799,000, May 20, 1977, abandoned. This application May 19, 1978, Ser. No. 907,587

Claims priority, application Japan, Jul. 15, 1976, 51-84806; Jul. 22, 1976, 51-87983; Jul. 23, 1976, 51-88373; Sep. 16, 1976, 51-111521; Sep. 16, 1976, 51-111522; Sep. 16, 1976, 51-111523; Sep. 16, 1976, 51-111524; Sep. 16, 1976, 51-111525

Int. Cl.[2] C22B 9/00; C21C 7/00

U.S. Cl. 75—93 G 2 Claims



1. A method for adding a treating agent to molten metal, the treating agent being contained in a treating agent adding member, said adding member comprising a self-burnable and self-eruptive material that does not alter the composition of the molten metal being treated and being formed of paper cylindrically wound in layers, an air layer being formed between adjacent paper layers, wherein the self-burning and self-eruptive action of said treating agent adding member causes the treating agent and molten metal to be agitated and convected.

4,200,457

FERROUS BASE ALLOY FOR HARD FACING

Arthur T. Cape, 580 El Dorado, Monterey, Calif. 93940

Filed Jan. 22, 1979, Ser. No. 4,993

Int. Cl.[2] C22C 38/44, 38/46, 38/54, 38/56

U.S. Cl. 75—122 2 Claims

1. A ferrous base alloy consisting of from about 0.70 to about 2.25% by weight of carbon, about 25 to about 30% by weight of chromium, from about 8 to about 15% by weight of nickel, from about 5 to about 9% by weight of molybdenum, from about 0.01 to about 0.5% by weight of boron, from about 2.5 to about 7% by weight of vanadium, from about 0.5 to about 4% by weight of tungsten and the balance substantially all iron, said alloy having an electron vacancy value or Nv number within the range of from about 1.75 to about 2.60.

4,200,458

METHOD FOR THE ALLOYING OF A METAL MELT

Karl-Erik Öberg, Viken, and Harry Bertheussen, Degerfors, both of Sweden, assignors to Scandinavian Lancers Aktiebolag, Höggnäs, Sweden

Filed Nov. 22, 1978, Ser. No. 962,937

Claims priority, application United Kingdom, Sep. 6, 1978, 35776/78

Int. Cl.[2] C22C 33/08

U.S. Cl. 75—129 8 Claims

1. A method for the alloying of a metal melt with at least one particulate alloying material belonging to the group consisting of lead, and metals, and compounds having physical properties similar to lead, said physical properties including non-fluidizability in a carrier gas of said particulate material when at least 90 weight percent of the particles of the particulate material have grain diameters in the range of 0.1 to 2.0 mm, by pneumatic injection of the non-fluidizable particulate alloying material through a lance into the melt, wherein a gas-powder suspension is prepared by fluidizing a particulate fluidizable material in a carrier gas, said gas-powder suspension being injected into the melt through said lance so as to accelerate said non-fluidizable particulate material so that said non-fluidizable material urged by the gas-powder suspension gains momentum sufficient for an efficient injection of the non-fluidizable material which therethrough is distributed in the melt together with said suspension.

4,200,459

HEAT RESISTANT LOW EXPANSION ALLOY

Darrell F. Smith, Jr., Huntington, W. Va.; David G. Tipton, Wilmington, N.C.; Edward F. Clatworthy, Huntington, and Donald E. Wenschhof, Jr., Milton, both of W. Va., assignors to Huntington Alloys, Inc., Huntington, W. Va.

Filed Dec. 14, 1977, Ser. No. 860,298

Int. Cl.[2] C22C 19/05, 30/00, 38/06, 38/48

U.S. Cl. 75—170 18 Claims

1. An age-hardenable alloy comprising 34% to 55.3% nickel, up to 25.2% cobalt, 1% to 2% titanium, 1.5% to 11% metal from the group columbium, tantalum and mixtures thereof in an amount providing that the total of columbium plus ½ tantalum is 1.5% to 5.5% of the alloy, up to 2% manganese and up to 1% chromium, and balance essentially iron with any presence of aluminum being restricted to 0.20% or lower, and characterized in the age-hardened conditioned by a thermal expansion inflection temperature of at least 650° F., a coefficient of expansion of $5.5\% \times 10^{-6}$ per °F. and a room temperature yield strength of at least 110,000 pounds per square inch.

4,200,460

ALLOYS FOR GETTERING MOISTURE AND REACTIVE GASES

Leonard N. Grossman, Livermore, and Douglas R. Packard, Sunol, both of Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 74,471, Sep. 22, 1970, abandoned. This application Sep. 30, 1974, Ser. No. 510,299

Int. Cl.[2] C22C 16/00

U.S. Cl. 75—177 2 Claims

1. A getter alloy having the essential components of zirconium, nickel and titanium comprised of about 4 weight percent nickel, about 11 weight percent titanium, and the balance being zirconium, said alloy being capable of reacting with water, water vapor, hydrogen, carbon monoxide, carbon dioxide, oxygen and hydrocarbons.

4,200,461

XANTHENE TYPE ACID DYE AND A BASE DYE-SENSITIZED ZINC OXIDE PHOTOCONDUCTIVE ELEMENT

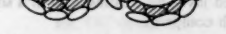
Kohei Kiyota, Machida; Hiroo Ueda, Tokyo; Shunji Kitagawa, Yokohama, and Kunihiko Tasai, Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan

Filed May 31, 1977, Ser. No. 801,723

Claims priority, application Japan, Jun. 9, 1976, 51-67949; Jul. 1, 1976, 51-78608

Int. Cl.[2] G03G 5/09

U.S. Cl. 430—91 6 Claims



1. A dye-sensitized zinc oxide photoconductive element having an enhanced photosensitivity over the entire band of visible rays, comprising an electroconductive substrate and a photoconductive layer supported on said substrate and comprising fine particles of zinc oxide having at least one xanthene

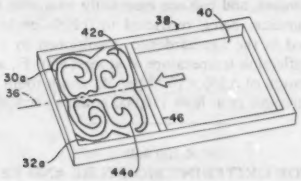
type acid dye and at least one basic dye, said acid dye being adsorbed in an amount of from 0.3 to 0.9%, based on the weight of said zinc oxide particles, on the outer surface of said zinc oxide particles and said basic dye being adsorbed in an amount of 10% or more, based on the weight of said acid dye, on the layer of said acid dye.

4,200,462

SYSTEM FOR PRODUCING DECORATIVE PLATES FOR PHOTOPRINTING

Richard F. Crafton, 65 F Tahoe Cir., and Lawrence Goldberg, 8B Bitter Root Ct., both of Owings Mills, Md. 21117

Filed Apr. 27, 1978, Ser. No. 900,485
Int. Cl.[2] G03C *5/04;* B44C *1/28;* B32B *31/18;* B29D *7/18;* B29C *17/02*
U.S. Cl. 430—494 **4 Claims**



1. The process for making a decorative pattern-photographic transparency comprising the steps:

a. producing a plurality of light transmitting wax sheets of different colors;

b. maintaining the plurality of wax sheets at a temperature rendering them pliable;

c. forming a laminate of the plurality of wax sheets;

d. forming the laminate into an elongate bar;

e. deforming said elongate bar;

f. producing a plurality of transverse sections of the elongate bar;

g. mosaicking the plurality of sections on a translucent support;

h. backlighting the mosaic; and

i. forming a photographic transparency of the backlighted mosaic.

4,200,463

SEMICONDUCTOR DEVICE MANUFACTURE USING PHOTORESIST PROTECTIVE COATING

Dervin L. Flowers, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 19, 1975, Ser. No. 642,425
Int. Cl.[2] G03C *5/00*
U.S. Cl. 430—317 **5 Claims**

1. In the method for forming a photoresist pattern on a semiconductor substrate by coating the substrate with a layer of photoresist, exposing the layer to a light pattern and developing the exposed layer by treating it with a solvent, the improvement which comprises:

coating the photoresist layer prior to exposure with a protective coating composition comprising a water-soluble, film-forming polyvinyl alcohol, a surfactant having wetting properties in an amount sufficient to reduce the surface tension of the composition and a surfactant having lubricant properties in an amount sufficient to reduce wear on materials in contact there with.

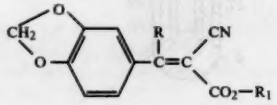
4,200,464

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS CONTAINING A UV FILTER COMPOUND

Tadao Shishido, and Naoki Arai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 732,830, Oct. 15, 1976, abandoned. This application Feb. 10, 1978, Ser. No. 876,801
Claims priority, application Japan, Oct. 16, 1975, 50-124751
Int. Cl.[2] G03C *1/84*
U.S. Cl. 430—512 **8 Claims**

1. A silver halide color photographic element containing at least one silver halide emulsion layer, said element containing at least one compound represented by the following formula (I) in an amount of at least about 0.05 g/m to function as an ultraviolet ray absorbing material:



(I)

wherein R represents a hydrogen atom or a lower alkyl group having 1 to 5 carbon atoms and R_1 represents an alkyl group having 1 to 20 carbon atoms.

4,200,465

ANTISTATIC LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC ELEMENT

Norio Chiba; Hideyuki Anzai; Hisashi Yamaguchi; Koichi Horigome; Masao Ishihara, and Sadatugu Terada, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 795,294, May 9, 1977, abandoned, which is a continuation of Ser. No. 630,646, Nov. 10, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,332
Claims priority, application Japan, Nov. 12, 1974, 49/130772
Int. Cl.[2] G03C *1/78, 1/96*
U.S. Cl. 430—527 **4 Claims**

1. A light-sensitive silver halide photographic element, having an emulsion layer on a film support, wherein the element contains 5×10^{-1} to 1×10^{-5} mole per m^2 of a glycidol and ethylene oxide addition copolymer of a phenol-aldehyde condensate, in which the molar portion of glycidol and ethylene oxide are respectively 1 to 20 moles and 5 to 100 moles per structural unit of the phenol-aldehyde condensate and wherein the copolymer is present in a light-sensitive silver halide emulsion layer, a subbing layer, an intermediate layer, an antihalation layer, a filter layer, a protective layer or a backing layer, or on an outermost surface of the element.

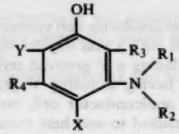
4,200,466

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIALS

Mitsuto Fujiwhara; Syunji Matsuo; Mikio Kawasaki; Toyoaki Masukawa, and Yutaka Kaneko, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 726,635, Sep. 27, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,056
Claims priority, application Japan, Sep. 30, 1975, 50-118480
Int. Cl.[2] G03C *1/06*
U.S. Cl. 430—566 **4 Claims**

1. A light-sensitive silver halide photographic material comprising an m-aminophenol type coupler represented by the formula,



wherein R_1 and R_2 individually represent a hydrogen atom, an alkyl group, an aryl group, an alkenyl group, or an aralkyl group; R_3 and R_4 individually represent a hydrogen atom, a halogen atom, a hydroxyl, an alkyl group, an alkoxy group, an alkylamido group, an arylamido group, an alkylsulfonamido group or an arylsulfonamido group; and X and Y individually represent a hydrogen atom, halogen atom or a group capable of being split off on the coupling reaction with an oxidation product of a primary amine type color developing agent, said group selected from the group consisting of sulfo and its salts, carboxyl and its salts, an alkoxy group, an aryloxy group, an alkylcarbonyloxy group, an alkylsulfonyloxy group, an arylcarbonyloxy group, an arylsulfonyloxy group, an alkylcarbamoyloxy group, an arylcarbamoyloxy group, a halogen-substituted alkylamido group, a halogen-substituted arylamido group, an alkylsulfonamido group, an arylsulfonamido grou, 5- or 6-membered imido-group, an arylthio group, an arylseleno group, an arylsulfonyl group, an arylazo group, or a 5- or 6-membered heterocyclic thio group containing in the molecular structure 1 to 4 nitrogen atoms, or one of X and Y is hydroxyl, mercapto, amino, an alkylamino group or an arylamino group, and the other is hydrogen atom, a halogen atom or a split-off group as defined above, said coupler not containing a color developing agent moiety in its molecular structure, whereby said coupler reacts with two molecules of an oxidation product of an aromatic primary amino color developing agent to form a neutral black dye image.

4,200,467
ZIRCONIUM-CONTAINING BOROSILICATE GLASSES

Heinz Bröemer, Hermannstein; Werner Huber, and Norbert Meinert, both of Solms-Albshausen, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,998

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729706

Int. Cl.[2] C03C *3/08, 3/30*

U.S. Cl. 106—47 Q **2 Claims**

1. A zirconium-containing borosilicate glass composition having a refractive index n_e in the range of between about $1.55<n_e<1.72$, an Abbe number ν_e in the range of between about $50>\nu_e>34$ and negative anomalous partial dispersion value $\Delta\nu_e$ between about -3.0 and -7.7, consisting essentially of the following components:

(a)	from about 8.4	to 45.5% by weight SiO_2, and
	from about 0.9	to 33.0% by weight B_2O_3, wherein the sum of (SiO_2 + B_2O_3) amounts to between about 31.6 and 46.4% by weight
(b)	from about 13.5	to 18.9% by weight ZrO_2, wherein the sum of (SiO_2 + B_2O_3 + ZrO_2) amounts to between about 46.1 and 64.4% by weight;
(c)	0	to about 5.0% by weight Li_2O,
	0	to about 22.3% by weight Na_2O,
	0	to about 10.0% by weight K_2O, and
	0	to about 24.0% by weight NaF, wherein the sum of the alkali metal oxides (Li_2O + Na_2O + K_2O) amounts to between 0 and about 21.8% by weight and the sum of (alkali metal oxides + NaF) amounts to between about 8.0 and 24.0% by weight;
(d)	0	to about 2.0% by weight BaO,
	0	to about 2.3% by weight ZnO,
	0	to about 0.5% by weight CdO, and
	0	to about 5.0% by weight PbO, wherein the sum of the bivalent oxides (BaO + ZnO + CdO + PbO) amounts to between 0 and about 5.5% by weight;
(e)	0	to about 9.9% by weight Al_2O_3,
	0	to about 24.8% by weight La_2O_3,
	0	to about 23.1% by weight Sb_2O_3, and
	0	to about 4.0% by weight Y_2O_3, wherein the sum of the trivalent oxides (Al_2O_3 + La_2O_3 + Sb_2O_3 + Y_2O_3) amounts to between 0 and about 26.9% by weight;
(f)	0	to about 5.0% by weight GeO_2, and
	0	to about 1.0% by weight TiO_2, wherein the sum of the tetravalent oxides (ZrO_2 + GeO_2 + TiO_2) amounts to between about 13.5 and 20.6% by weight;
(g)	0	to about 5.0% by weight Nb_2O_5, and
	0	to about 33.1% by weight Ta_2O_5, wherein the sum of the pentavalent oxides (Nb_2O_5 + Ta_2O_5) amounts to between 0 and about 36.1% by weight; and
(h)	0	to about 2.1% by weight WO_3.

4,200,468
GLAZE-FORMING COMPOSITION

Donald C. Hurley, Jr., 183 St. Joseph, Long Beach, Calif. 90803

Filed Aug. 27, 1976, Ser. No. 718,344

Int. Cl.[2] C03C *5/02*

U.S. Cl. 106—48 **5 Claims**

1. A glaze-forming composition for producing a matured glaze on a ceramic clay body, said glaze-forming composition being a plastic, malleable, coherent mass which is moldable onto an unfired ceramic clay body and maturable into a glaze on the surface of said unfired ceramic clay body upon firing, and is bondable to said unfired ceramic clay body, said glaze-forming composition consisting essentially of plastic clay, a glaze flux, alumina, and silica, at least a portion of the alumina and silica being derived from the clay, the amount of clay in said glaze-forming composition being at least 30%, by weight, the molecular ratio of flux to alumina to silica, including the alumina and silica in the plastic clay, being from 1-.3-2.2 to 1-1.1-7.

4,200,469
METHOD OF FIRING A ROTARY KILN AND APPARATUS THEREFOR

Jorn Touborg, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Apr. 19, 1978, Ser. No. 897,843

Claims priority, application United Kingdom, Apr. 19, 1977, 16174/77

Int. Cl.[2] C04B *7/44*

U.S. Cl. 106—100 **10 Claims**

1. A method of firing a rotary kiln for the production of hot cement clinker, comprising:

directing at least a major portion of the amount of fuel necessary for firing the kiln so as to be brought into direct contact with the hot cement clinker in the precooling zone of the kiln.

4,200,470

METHOD AND APPARATUS FOR CLEANING AMPULES OR SIMILAR CONTAINERS

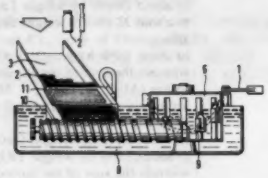
Ingbert Pennekamp, Crailsheim, Fed. Rep. of Germany, assignor to H. Strunck GmbH & Co. Maschinenfabrik, Köln-Ehrenfeld, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,929

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1977, 2747044

Int. Cl.[2] B08B 3/04

U.S. Cl. 134—1 8 Claims



1. A method of cleaning ampules and similar containers comprising the steps of:

delivering a quantity of ampules to be cleaned;

rinsing said quantity of ampules;

submerging said quantity of ampules in a water bath;

subjecting said water bath to ultrasonic vibrations to ultrasonically clean said ampules in said water bath;

separating said ampules from each other in said water bath;

conveying said separated ampules out of said water bath;

spraying said separated ampules with a cleaning fluid; and

blow drying said ampules subsequent to said spraying step.

4,200,471

PROCESS FOR CLEANING SPINNERETS

Wolfgang Burghardt, Bobingen, and Wilhelm Bronner, Konigsbrunn, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 20, 1977, Ser. No. 862,524

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658119

Int. Cl.[2] B08B 9/00

U.S. Cl. 134—22 R 3 Claims

1. Process for the cleaning of spinnerets during the manufacture of polyesters by warming them in a cleaning bath of a polyglycol mixture, which comprises using a mixture of polyethylene glycols consisting of at least 70% by weight, relative to the polyethylene glycol mixture, of polyethylene-glycols of the group consisting of tri-, tetra-, penta- and, hexaethylene glycol and of from a minimum of 2 to a maximum of 10% by weight of one or more polyethylene glycols of the group consisting of mono- and diethylene glycol, and up to 20% by weight of polyethylene glycols of the group consisting of hepta-, octa- and higher ethylene glycols.

4,200,472

SOLAR POWER SYSTEM AND HIGH EFFICIENCY PHOTOVOLTAIC CELLS USED THEREIN

Terry I. Chappell, Concord, and Richard M. White, Berkeley, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Jun. 5, 1978, Ser. No. 912,724

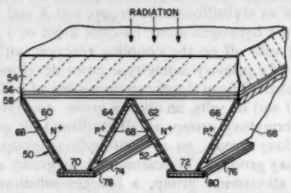
Int. Cl.[2] H01L 31/06

U.S. Cl. 136—89 PC 29 Claims

1. A solar electric power system comprising support means, concentrator means cooperatively mounted with said support means for receiving and concentrating solar radiation, a photovoltaic cell module mounted on said support means to receive said concentrated solar radiation, said module including a heat conductive housing having an open end,

a photovoltaic semiconductor cell mounted across said open end in abutment with a heat transfer block, said semiconductor cell including a V grooved surface and said heat transfer block having a mating V grooved surface for receiving said semiconductor cell, metallic sponge and wick means attached to said heat transfer block and depending therefrom and into said housing, and liquid means within said housing for facilitating heat transfer.

13. A photovoltaic cell having a grooved surface adapted to mate with a grooved surface of a heat transfer block comprising a plurality of single crystal semiconductor elements of one



conductivity type, each element having a generally trapezoidal cross section which defines said grooved surface, a supporting glass plate, means attaching the base of each said trapezoidal element to said glass plate whereby each element can receive solar radiation through said glass plate, a layer of reflective material on a second side of each element which is opposite to said one side attached to said glass plate, a first region of doped semiconductive material of said one conductivity type formed in a first surface region of each said element, and a second region of doped semiconductive material of opposite conductivity type formed in a second surface region of each said element, and means electrically interconnecting said semiconductor elements.

4,200,473

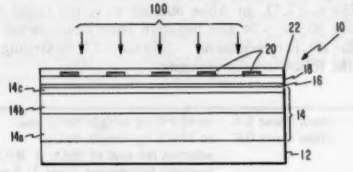
AMORPHOUS SILICON SCHOTTKY BARRIER SOLAR CELLS INCORPORATING A THIN INSULATING LAYER AND A THIN DOPED LAYER

David E. Carlson, Yardley, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 12, 1979, Ser. No. 19,585

Int. Cl.[2] H01L 31/06

U.S. Cl. 136—89 SJ 12 Claims



1. An amorphous silicon solar cell comprising:

an electrically conductive substrate;

a body of hydrogenated amorphous silicon including a first region of one conductivity type that electrically contacts said substrate, a second, intrinsic region contiguous to said first region and a third region of a conductivity type opposite to that of said first region and contiguous to said second region, wherein the thickness of said third region and the concentration of the conductivity modifiers in said third region are selected such that said third region is fully ionized by a Schottky barrier metal;

a layer of electrically insulating material contiguous to and

deposited on said third region of hydrogenated amorphous silicon;

a metal layer contiguous to said insulating layer, forming a Schottky barrier therewith which is incident to solar radiation; and

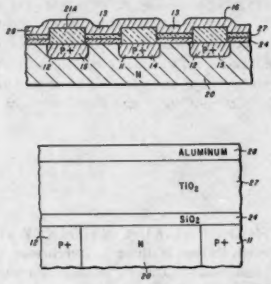
means for electrically contacting said Schottky barrier.

4,200,474

METHOD OF DEPOSITING TITANIUM DIOXIDE (RUTILE) AS A GATE DIELECTRIC FOR MIS DEVICE FABRICATION

Henry B. Morris, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 20, 1978, Ser. No. 962,259
Int. Cl.² H01L *21/285, 21/324*
U.S. Cl. 148—1.5 **7 Claims**



1. A method of forming a layer of titanium dioxide on a substrate of semiconductor material, comprising:

forming an insulating layer of a controlled thickness on a substrate of semiconductor material;

depositing a layer of titanium metal on the insulating layer;

thermally oxidizing the layer of titanium metal in a dry oxygen atmosphere at a temperature maintained in excess of 200 Degrees C.; and

converting the layer of titanium metal into a titanium dioxide layer of rutile form in response to the thermal oxidation thereof.

4,200,475

PROCESS FOR DYEING ALUMINUM-CONTAINING ZINC-BASED ALLOYS

Nobuyoshi Kasahara, Sayama, and Koutaro Nonumura, Kunitachi, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Sep. 26, 1978, Ser. No. 945,996
Int. Cl.² C23F *7/26, 5/04*
U.S. Cl. 148—6.1 **3 Claims**

1. A process for dyeing an aluminum-containing zinc based alloy containing from 12 to 30 weight % of aluminum, comprising the steps of:

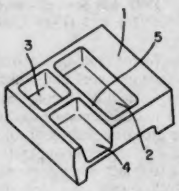
immersing said aluminum-containing zinc-based alloy in an alkaline aqueous solution containing hexavalent chromium ion, further immersing the thus treated alloy in an acidic aqueous solution containing hexavalent chromium ion and then dyeing the thus further treated alloy in an aqueous solution of an organic dyestuff thereby to obtain a dyed aluminum-containing zinc-based alloy having decorative appearance and corrosion resistance.

4,200,476

PROCESS FOR THE THERMAL TREATMENT OF THICK PRODUCTS MADE OF COPPER-CONTAINING ALUMINUM ALLOYS OF THE 7000 SERIES

Bruno Dubost, and Jean Bouvaist, both of Grenoble, France, assignors to Societe de Vente de l'Aluminium Pechiney, Paris, France

Filed Nov. 20, 1978, Ser. No. 961,861
Claims priority, application France, Nov. 21, 1977, 77 35673
Int. Cl.² C22F *1/04*
U.S. Cl. 148—12.7 A **10 Claims**



1. In a process for the thermal treatment of a thick product formed of aluminum alloy of the 7000 series containing at least 0.05% by weight of copper, and having at least one part which has an equivalent thickness of greater than about 15 mm, the thermal treatment being a solution heat treatment including quenching and tempering, the tempering treatment comprising the steps of:

preliminary tempering within a temperature range of between 100° and 150° C. for a period lasting from 5 minutes to 24 hours; and,

intermediate tempering at a higher temperature than the temperature at which preliminary tempering occurs, the intermediate tempering step comprising a continuous increase in temperature immediately followed by continuous cooling without an isothermal plateau,

characterized in that the intermediate tempering treatment comprises a rise in temperature at a rate above 1° C. per minute in the range of temperatures of between 150° C. and 190° C. followed by an evolution in the temperature of the product as a function of time, or $\theta(t)$, comprising at least a period at a temperature above 190° C. for a total duration T in such a way that the function:

$$R(T) = \frac{10^{10}}{K} \int_0^T e^{\frac{-13400}{\theta(t)}} dt$$

is between 1 and 4, in which:

e is the base of the Napierian logarithms;

T is the duration (in seconds) taken from the moment when the temperature of the product reaches a temperature of 190° C. for the first time in the rising direction;

$\theta(t)$ is the temperature in °K. of the coldest point of the product above 463° K. (190° C.) and below 523° K. (250° C.) and preferably, below 508° K. (235° C.);

t is the time in seconds; and,

K=3 for the 7050 alloy, and

1.5 for the other alloys of the 7000 series;

the total duration of residence t_m (in minutes) in the intermediate tempering step always being higher than or equal to the value given by the equation:

$$34 \log t_m = 260 - \theta_M$$

in which θ_M is the maximum temperature attained by the product in °C.

2. A process according to claim 1 and further comprising the step of plastically deforming the product after quenching.

characterized in that the values of K is 2.25 for the 7050 alloy and 1.05 for the alloys except for the 7050 alloy.

4,200,477

PROCESSING FOR ELECTROMAGNETIC SILICON STEEL

Amitava Datta; Clarence L. Miller, Jr., both of Pittsburgh, and Jack W. Shilling, Monroeville, all of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Mar. 16, 1978, Ser. No. 887,098

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.[2] H01F *1/04*

U.S. Cl. 148—113 **16 Claims**

1. In a process for producing electromagnetic silicon steel having a cube-on-edge orientation, which process includes the steps of: preparing a melt of silicon steel having up to 0.07% carbon, from 0.01 to 0.25% manganese, from 0.01 to 0.09% of material from the group consisting of sulfur and selenium, from 2.5 to 4.0% silicon, up to 1.0% copper, less than 0.009% aluminum and less than 0.0006% boron; casting said steel; hot rolling said steel; cold rolling said steel; decarburizing said steel; annealing said cold roll steel of final gage; applying a refractory oxide coating to said steel; and final texture annealing said steel; the improvement comprising the steps of annealing said cold roll steel of final gage in a hydrogen-bearing atmosphere having a p_{H_2O}/p_{H_2} of from 0.015 to 0.3; coating the surface of said steel with a refractory oxide coating consisting essentially of:

(a) 100 parts, by weight, of at least one substance from the group consisting of oxides, hydroxides, carbonates and boron compounds of magnesium, calcium, aluminum and titanium;

(b) up to 100 parts, by weight, of other substances from the group consisting of boron and compounds thereof;

(c) from 0.1 to 100 parts, by weight, of at least one oxide less stable than SiO_2 at temperatures up to 2150° F., said oxide being of an element other than boron;

(d) up to 40 parts, by weight, of SiO_2;

(e) up to 20 parts, by weight, of inhibiting substances; and

(f) up to 100 parts, by weight, of fluxing agents;

and final texture annealing said steel with said coating thereon.

4,200,478

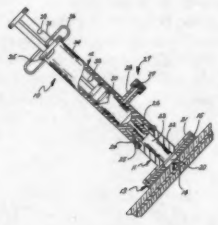
GLASS BREAK REPAIR APPARATUS AND METHOD

Gerald Jacino, 87-43 115 St., Richmond Hill, N.Y. 11418, and Anthony Jacino, 17 Normandie LA., East Moriches, N.Y. 11940

Filed May 30, 1978, Ser. No. 910,457

Int. Cl.[2] B32B *35/00*

U.S. Cl. 156—94 **12 Claims**



1. An apparatus for repairing a break in class comprising a pedestal, said pedestal including a flange portion, a chamber, said chamber in said pedestal, said chamber having two openings, one said opening in said flange portion, said other opening including means adapted to receive a syringe in airtight engagement, said chamber of sufficient size to act as a reservoir for glass repair resin, adhesive sealing means, said adhesive sealing means adapted to directly seal said pedestal at said flange in airtight engagement over a break in glass with said chamber in substantial communication with said glass break, and a syringe, said syringe having a lower end engagable at said other chamber opening, said syringe including valve means near its lower end, a plunger with a stem, retaining means on the body of said syringe, said retaining means adapted to selectively retain said stem and hold said stem in fixed position.

10. A method for repairing a break in glass comprising the steps of sealing a pedestal over a break in said glass, said pedestal including a flange portion, a chamber, said chamber in said pedestal, said chamber having two openings, one said opening in said flange portion, said other opening including means adapted to receive a syringe in airtight engagement, said chamber of sufficient size to act as a reservoir for glass repair resin, adhesive sealing means, said adhesive sealing means adapted to directly seal said flange in airtight engagement over a break in glass with said chamber in substantial communication with said glass break, emplacing a syringe, said syringe having a lower end engagable at said other chamber opening, said syringe including valve means near its lower end, a plunger with a stem, retaining means on the body of said syringe, said retaining means adapted to selectively retain said stem and hold said stem in fixed position, a flowable hardenable resin in said syringe, and creating a vacuum in said syringe to exhaust air from said break and allow the flow of resin into said break.

4,200,479

METHOD OF MAKING A HOCKEY STICK

William E. Ardell, Barrie; William A. Burchmore, Candiac; Leo P. Drolet, and Michel Drolet, both of Sherbrooke, all of Canada, assignors to La Corporation Inglasco Ltee, Sherbrooke, Canada

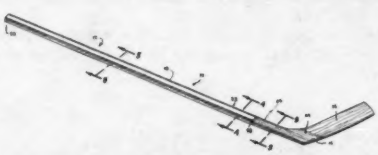
Division of Ser. No. 668,742, Mar. 19, 1976, Pat. No. 4,159,114.

This application Feb. 24, 1978, Ser. No. 880,798

Claims priority, application Canada, Mar. 12, 1976, 248349

Int. Cl.[2] A63B *59/14;* B32B *31/20*

U.S. Cl. 156—154 **6 Claims**



1. A method of making a handle component for the construction of hockey sticks, comprising the steps of making at least one shallow groove of constant depth in each wide side surface of an elongated piece of hardwood of predetermined constant rectangular cross-section whose four corners are defined by non-squared surfaces with the adjacent surfaces, the arrangement of at least one groove in each wide side surface being located centrally of the associated wide side surface and each groove extending throughout the length of said piece of hardwood, inserting into each of said grooves a preformed strip of resin impregnated undirectional continuous fiber material whose dimensions closely conform to those of said grooves, providing a coating of a suitable adhesive to at least some of the mating groove and strip surfaces, inwardly pressing said strips into their respective grooves and maintaining the pressure until substantial curing of said adhesive, and wherein during the curing step a plurality of stick handles are disposed parallel to one another over a table on one of their narrow sides and pressed together between two inwardly urging side members.

4,200,480

ADHESIVE JOINING OF PIPES

Leon E. Wolinski, Cheektowaga, and Peter D. Berezuk, Kenmore, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 705,333, Jul. 14, 1976, Pat. No. 4,080,238, and a continuation-in-part of Ser. No. 763,145, Jan. 27, 1977, Pat. No. 4,126,504. This application Nov. 7, 1977, Ser. No. 849,234

The portion of the term of this patent subsequent to Nov. 21, 1995, has been disclaimed.

Int. Cl.[2] B29C *19/00*

U.S. Cl. 156—294 20 Claims

1. A method for joining a pipe section with at least one end having a first mating surface,

said section adapted to be joined to another element having a second mating surface adapted to fit together with and be joined to the first mating surface,

applying to at least one of said mating surfaces a free radical polymerization catalyst activator,

applying to at least one of said mating surfaces an activatable, curable adhesive comprising a solution of a non-reactive elastomeric polymer resin member selected from the group consisting of homopolymers of butadiene and lower alkyl substituted butadienes, copolymers of styrene or acrylonitrile or methylmethacrylate with butadiene or lower alkyl substituted butadienes, carboxy modified acrylonitrilebutadiene copolymers, neoprene, butyl rubber, silicones other than dimethyl silicone, polysulfide rubber, pyridinebutadiene copolymer, chlorosulfonated polyethylene, polyethers of epichlorhydrin, and the said polymers and copolymers having vinyl group-containing monomers grafted thereon,

said member being dissolved in a free radical addition polymerizable acrylic monomer and a free radical addition polymerizable acid monomer co-polymerizable with said acrylic monomer,

said solution containing a catalytically effective amount of a non-activated free radical addition polymerization catalyst having a half-life of at least about one-half hour at 85° C.,

joining said mating surfaces in a contact relationship and activating the polymerization catalyst,

and maintaining said contact relationship until said adhesive cures to a set.

11. A method for joining a pipe section with at least one end having a first mating surface,

said section adapted to be joined to another element having a second mating surface adapted to fit together with and be joined to the first mating surface,

applying to at least one of said mating surfaces a free radical polymerization catalyst activator,

applying to at least one of said mating surfaces an activatable, curable adhesive comprising a solution of a non-reactive elastomeric polymer resin member selected from the group consisting of homopolymers of butadiene and lower alkyl substituted butadienes, copolymers of styrene or acrylonitrile or methylmethacrylate with butadiene or lower alkyl substituted butadienes, carboxy modified acrylonitrilebutadiene copolymers, neoprene, butyl rubber, silicones other than dimethyl silicone, polysulfide rubber, pyridinebutadiene copolymer, chlorosulfonated polyethylene, polyethers of epichlorhydrin, and the said polymers and copolymers having vinyl group-containing monomers grafted thereon,

said member being dissolved in a free radical addition polymerizable acrylic monomer and a free radical addition polymerizable acid monomer co-polymerizable with said acrylic monomer,

said solution containing a catalytically effective amount of a non-activated free radical addition polymerization catalyst having a half-life of at least about one-half hour 85° C.,

said solution having dispersed therein rupturable microspheres encapsulating a free radical polymerization activator whereby to form an adhesive dispersion,

in any order applying to at least one of said mating surfaces the adhesive dispersion and rupturing the microspheres joining said mating surfaces in a contact relationship and maintaining the contact relationship until the adhesive cures to a set.

4,200,481

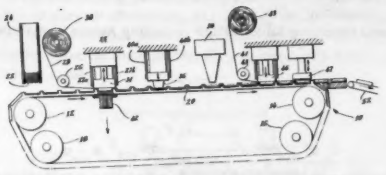
APPARATUS FOR MAKING A LINED TRAY

Rudolph A. Faller, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 27, 1978, Ser. No. 928,357

Int. Cl.[2] B29C *17/04*

U.S. Cl. 156—382 10 Claims



1. Apparatus for manufacturing lined trays, comprising:

conveyor means for transporting a plurality of trays along a predetermined path; and

means for applying a first film to the trays being transported and for deforming at least portions of said first film into the interior of each tray as it is transported past a predetermined point to form a liner within the tray, said applying and deforming means including

(1) a shiftably mounted plate on one side of said first film having surface areas for engaging said first film and pressing the latter into contact with the tray, said plate including means for heating said surface areas thereof and a first and second set of apertures in said surface areas thereof communicating with said first film, said first set of apertures being adapted to be coupled with a source of negative air pressure for normally holding said first film against said planar surface areas in face-to-face contact with the latter whereby to provide thorough uniform heating of said film, said second set of apertures being adapted to be operably coupled with a source of positive air pressure for urging said first film away from said plate when said first film is contacting said tray whereby to deform said first film into said tray, and

(2) air suction means on the opposite side of said first film and spaced from said plate for creating negative air pressure between the interior of the tray and said first film whereby to contribute to the deformation of said first film into said tray.

4,200,482

PROCESS AND APPARATUS FOR THE PRODUCTION OF A PIPE-SHAPED HOLLOW BODY, ESPECIALLY OF CONTAINER TUBES FROM A MULTILAYER COMPOSITE SHEET MATERIAL

Karl Mägerle, Im vorderen Erb 1, 8700 Kusnacht, Switzerland

Filed Oct. 3, 1977, Ser. No. 838,966

Claims priority, application Switzerland, Oct. 6, 1976, 12614/76

Int. Cl.[2] B29D *23/10*

U.S. Cl. 156—443 9 Claims

1. Apparatus for producing a tubular body from a blank of sheet material of which the opposite faces, at at least adjacent respective opposite lateral margins of each face are made of mutually weldable thermoplastic material, the blank having a central section, and two opposite flanks which respectively

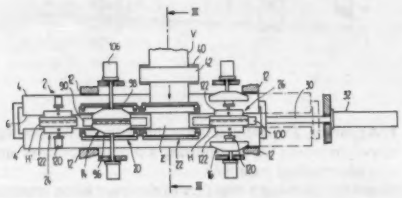
have said opposite lateral margins distally of the central section, said apparatus comprising:

a fixed mandrel;

a loading station including means for advancing a web of said sheet material and severing means for separating from said web a succession of such blanks; a receiving table which is shiftable longitudinally of the mandrel between a more remote position and an adjacent position; clamping means associated with the receiving table; said loading station serving said receiving table at said remote position for advancing onto the latter a leading end section of the web;

said clamping means including means for clamping said leading end section of the web on said receiving table prior to the separating of a blank from the web corresponding to said leading end section for situationally predetermining by the severing means where the lateral margins of the separated blank will be relative to the receiving table;

said receiving table further including means to maintain the



separated blank clamped by said clamping means with the lateral margins located as situationally predetermined during the longitudinal shifting of said receiving table to said adjacent position thereof;

means for urging while clamped by said clamping means a situationally predetermined medial portion of the blank, which is included in said central section, against a situationally predetermined corresponding site upon the mandrel for situationally predetermining where the lateral margins of the blank will be relative to a welding means when the blank is convolutely conformed to the mandrel; means for releasing the blank from the clamping means after being urged against said corresponding site;

means for conforming the so-aligned blank, convolute fashion, about the mandrel from the central section toward both opposite lateral margins thereof, until both opposite lateral margins are overlapped upon the mandrel, this conforming means including a set of forming jaws, movable laterally toward and away from the mandrel; and

means facing the mandrel for welding the overlapped lateral opposite margins of the blank to one another.

4,200,483

DEVICE FOR PRESSING LABELS OR FOILS ONTO OBJECTS

Egon Höveler, Haan, Fed. Rep. of Germany, assignor to Jagenberg-Werke Atkiengesellschaft, Dusseldorf, Fed. Rep. of Germany

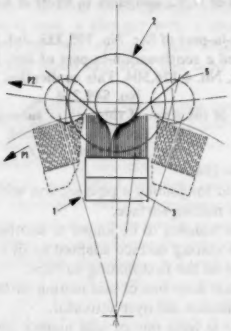
Filed Nov. 9, 1977, Ser. No. 850,107

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1976, 2651911

Int. Cl.[2] **B65C** *3/18, 9/36*

U.S. Cl. 156—487 **4 Claims**

1. In an apparatus for labeling objects having a non-cylindrical portion and moveable in a straight or curved path and of the type having gripper elements for releasably positioning gummed labels or foils at the level of the noncylindrical portion; means for applying the labels or foils, when released by the gripper elements, to the objects comprising at least one pressing element movably advanced in synchronism with the objects along a path that is convexly curved with respect to the object path, each pressing element having a pliable pad disposed at the level of the noncylindrical portion which is to be provided with the label or foil, wherein the pad comprises a



plurality of elements disposed side by side, which independently of one another exert one of a point or line pressure during the applying action.

4,200,484

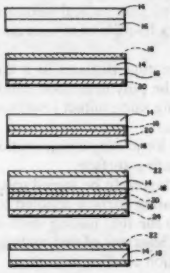
METHOD OF FABRICATING MULTIPLE LAYER COMPOSITE

Howard L. Glass, Orange, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 6, 1977, Ser. No. 831,033

Int. Cl.[2] **B01J** *17/04*

U.S. Cl. 156—622 **8 Claims**



1. A method of fabricating a linearly dispersive or non-dispersive magnetostatic surface wave delay line, comprising:

clamping first and second substrates together with first faces of said substrates directed away from each other and with second faces of said substrates urged against and into sealing relationship with each other;

immersing said clamped first and second substrates into a first molten flux for the liquid phase epitaxial deposition by the dipping method of first films of a first ferrimagnetic material selected from the group consisting of garnet ferrite, spinel ferrite, hexagonal ferrite, and orthoferrite on said first faces of said first and second substrates;

removing said first and second substrates from said first molten flux;

clamping said first and second substrates together with said second faces of said substrates directed away from each other and with said first faces of said substrates having said first films thereon urged against and into sealing relationship with each other;

immersing said clamped first and second substrates into a second molten flux for the liquid phase epitaxial deposition by the dipping method of second films of a second ferrimagnetic material selected from the group consisting of garnet ferrite, spinel ferrite, hexagonal ferrite, and orthoferrite on said second faces of said first and second substrates;

controlling a condition of said second molten flux in a manner which causes said second ferrimagnetic material to have magnetic characteristics different from the magnetic characteristics of said first magnetic material; and

using the monolithic multiple layer composite thus formed in said magnetostatic surface wave delay line.

4,200,485

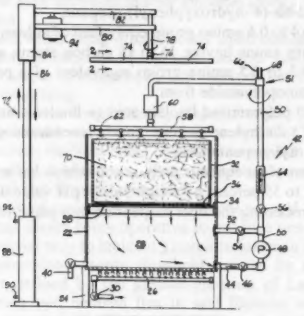
METHOD FOR MAKING HIGH PURITY, DEVITRIFICATION RESISTANT, AMORPHOUS SILICA FIBERS

George B. Price, Bowling Green, Ohio, and William H. Kielmeyer, Englewood, Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Aug. 30, 1978, Ser. No. 938,156

Int. Cl.[2] **B44C** *1/22;* **C03C** *15/00, 25/06;* **C01B** *33/12*

U.S. Cl. 423—335 **8 Claims**



1. A double leaching process for making amorphous silica fibers having excellent resistance to devitrification at temperatures up to 2500° F. comprising:

providing a mass of glass fibers having a composition, on a weight basis, of about 72.6–75% silica, at least about 23.5% soda, about 0.02–0.16% alumina, and less than about 0.01% titanium dioxide, into a digestor,

leaching the fibers in a first leaching cycle comprising:

forming in said digestor a slurry comprising said fibrous mass and a leaching solution, said fibrous mass being covered with said leaching solution,

heating said slurry to a temperature within the range of about 180°–205° F. and during said heating withdrawing leaching solution from the digestor at a point below said fibrous mass and reintroducing the leaching solution to the top surface of the fibrous mass, and periodically gently stirring said slurry to prevent settling of the fibers and channeling and to fluff the fibers up into a loose mass to facilitate uniform flow of the leaching solution through the entire mass,

draining the leaching solution from the digestor,

rinsing the fibrous mass in an initial rinsing cycle in order to remove residue leaching solution and soluble salts and during said rinsing periodically gently stirring said fibrous mass to prevent channeling and settling of the fibers and to fluff up the fibrous mass to facilitate uniform flow of the rinsing solution through the fibrous mass,

leaching said fiber in a second leaching cycle comprising:

again forming in said digestor a slurry comprising said fibrous mass and a leaching solution, said fibrous mass again being covered with said leaching solution,

again heating said slurry to a temperature within the range of about 180°–205° F. and during said heating withdrawing leaching solution from the digestor at a point below said fibrous mass and reintroducing the leaching solution to the top surface of the fibrous mass, and periodically gently stirring said slurry to prevent settling of the fibers and channeling and to fluff the fibers up into a loose mass to facilitate uniform flow of the leaching solution through the entire mass,

again draining the leaching solution from the digestor when the batch of fibers is leached to the desired extent,

again rinsing the fibrous mass in a final rinsing cycle to remove residue leaching solution and soluble salts and during said rinsing periodically gently stirring said fibrous mass to prevent channeling and settling of the fibers and to fluff up the fibrous mass to facilitate uniform flow of the rinsing solution through the fibrous mass, and drying the fibrous mass.

4,200,486

METHOD OF AND APPARATUS FOR RECLAIMING METALS AND PLASTICS FROM SCRAP PAPER

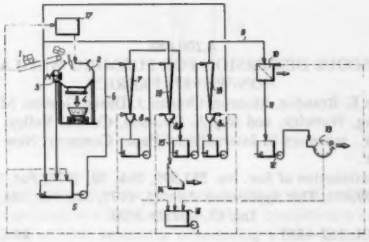
Svetozár Vagač, Bratislava; Břetislav Procházka, Břidličná; Jiří Mueller, Litovel; Anton Kostka, and Milan Čársky, both of Bratislava, all of Czechoslovakia, assignors to Vyskumny ustav papieru a celulozy, Bratislava, Czechoslovakia

Filed Jul. 27, 1977, Ser. No. 819,521

Claims priority, application Czechoslovakia, Jul. 27, 1976, 4920/76

Int. Cl.[2] **D21C** *5/02*

U.S. Cl. 162—8 **2 Claims**



1. Method for reclaiming paper stuff, metal and plastic material from scrap of combined paper material comprising layers of paper, of metal foils, of plastic foils and a binding agent, comprising defibrating the combined paper material, in a defibrator having a tank receiving the defibrated material, exposing the defibrated material from the tank to separating by a battery of series connected cyclone separators the bottom discharge of said separators predominantly containing metals, leading material from the overflow discharge of the last of said series containing paper stuff and parts of foils of plastic material to a screening separator and dividing it into two streams, the material which passes through the screen of the screen separator predominantly containing paper fibers, and the screen overflow from the separator screen together with the overflow from the tank of the defibrator predominantly containing parts of the plastic foil material, the defibration being performed in an alkaline medium at a minimum temperature of 40° C., and after separation of the predominantly plastic foil material adding a coagulation agent to material which passes through the screen of the screen separator to cause a coagulation of the paper fibers therein.

4,200,487

ECONOMICAL METHOD OF MAKING HIGH-STRENGTH GLASS FIBER MATS PARTICULARLY USEFUL FOR ROOFING PRODUCTS

Alfredo A. Bondoc, Middlesex; V. Robert Canfield, Martinsville, and B. Randall Ziegler, Freehold, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 16, 1979, Ser. No. 39,578
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—135 13 Claims

1. A method of making high-strength glass fiber mats comprising a plurality of individual filament glass fibers comprising about 20% to 60% by weight of the fibrous material in said mat, and a plurality of extended glass fiber elements comprised of longitudinally connected fibers said elements there having a length which is greater than the length of the fibers in said element, and a diameter which is nonuniform, being greater in the mid-portion thereof than at its ends, said elements comprising about 40% to 80% by weight of the fibrous material in said mat, both said individual filament fibers and said extended fiber elements being substantially randomly oriented and uniformly dispersed throughout said material, and having a binder substance therein to hold said fibrous material together which comprises the steps of:

(a) forming an aqueous slurry of bundles of glass fiber having a length of about 1¾ to 3 inches and a diameter of about 8 to 20 microns and a dispersant,

(b) gently agitating said slurry to disperse said bundles into said individual filaments and extended fiber elements,

(c) passing said thus agitated dispersion slurry onto a mat-forming screen to form said fibrous mat and removing water therefrom and,

(d) applying a binder to said mat.

4,200,488

VISCOUS DISPERSION FOR FORMING WET-LAID, NON-WOVEN FABRICS

Ralph E. Brandon, Monroe; Charles J. Davis, Goshen; Michael Ring, Warwick, and Roy S. Swenson, Central Valley, all of N.Y., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 551,399, Feb. 20, 1975, Pat. No. 4,049,491. This application Apr. 11, 1977, Ser. No. 786,590
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—101 44 Claims

1. In a process for forming a non-woven fabric by wet-laying fibers on paper making equipment, the fabric containing staple length, synthetic fibers having a length to diameter ratio of about 400 to 3000, the fabric having a microvariation in basis weight of not more that about 10% and a macrovariation in basis weight of not more than about 5%, and the fabric being essentially free of knits, bundles and strings, the improvement which comprises forming a stable, viscous, uniform, air, fiber and water dispersion by the steps of:

providing the fibers in a high-shear agitated, air, fiber and water mixture, which contains a dispersant and throughout which the fibers are completely and uniformly distributed; and

then, slowly adding, over a period of about 10 minutes or longer, a thixotropic thickener to the high-shear agitated mixture to form the viscous dispersion;

the viscous dispersion containing about 1% to 50% by volume of entrained air and having a nascent viscosity of about 10 to 125 cps., when measured at a shear rate of 30.5 sec.$^{-1}$; and individual fibers in the viscous dispersion being restrained from becoming entangled and from forming knits, bundles and strings.

4,200,489

PROCESS FOR PRODUCING SIZED PAPER OR CARDBOARD WITH DYES OR OPTICAL BRIGHTENERS AND EPOXIDE-AMINE-POLYAMIDE REACTION PRODUCTS

Hugo Tlach, Basel; Klaus-Dieter Leifels, Binningen, and Werner Mischler, Burg, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,688
Claims priority, application Switzerland, Aug. 26, 1977, 10456/77
Int. Cl.[2] D21H *3/58*
U.S. Cl. 162—162 10 Claims

1. A process for producing paper or cardboard which is sized in the pulp with an epoxide-amine-polyamide reaction product, comprising the steps of adding to the pulp fiber suspension

(A) an amount effective to enhance the sizing effect of component of a water soluble, direct, sulfonic acid-containing azo dye or a water-soluble, sulfonic acid-containing optical brightener of the distyrylbiphenyl or bis-triazinylaminostilbene classes, followed by

(B) an effective amount of a water-soluble or water- dispersible salt of an epoxide-amine-polyamide reaction product of

(a) 1.0 epoxide group equivalent of a polyglycidyl ether of 2,2-bis-(4'-hydroxyphenyl)-propane,

(b) 0.4 to 0.6 amino group equivalent of at least one monofatty amine having 16 to 18 carbon atoms, and

(c) 0.3 to 0.5 amino group equivalent of a polyalkylene aminopolyamide from

(c') polymerised linoleic acid or linolenic acid and

(c'') diethylenetriamine, triethylenetetramine or tetraethylenepentamine,

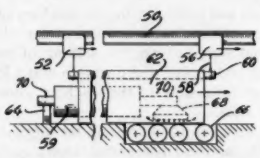
in the form of an aqueous preparation which has a solids content of 25 to 35 percent by weight, and a pH value of 4 to 5 and further processing the fiber suspension into paper or into cardboard.

4,200,490

METHOD AND APPARATUS FOR HANDLING ROLLS INSIDE AN ENDLESS PAPER-MAKING BELT

Peter K. O'Hagan, Westmount, Canada, assignor to Scapa Canada Ltee, St. Laurent, Canada

Filed Jul. 24, 1978, Ser. No. 927,480
Claims priority, application Canada, Jul. 21, 1978, 307888
Int. Cl.[2] D21F *1/26*
U.S. Cl. 162—200 18 Claims

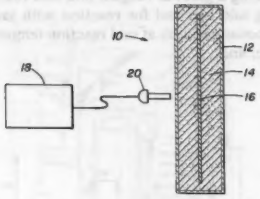


9. A method for removing heavy rolls from within an endless paper-making belt, including the steps of first releasing the tension on the belt, supporting ends of the rolls on air casters such that the rolls and air casters are spaced from the floor, and moving the supported rolls from within the belt and clear of the belt so as to allow changing of the belt.

4,200,491
APPARATUS AND METHOD FOR DETECTING POWER DISTRIBUTION IN A NUCLEAR REACTOR FUEL ELEMENT

Russell M. Ball, Lynchburg, Va., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 6, 1977, Ser. No. 794,441
Int. Cl.[2] G21C 17/00
U.S. Cl. 176—19 R 6 Claims



1. A device for detecting the residual gamma radiation indicative of the recent power distribution of a used nuclear reactor fuel element comprising the combination of:

a radiation detector of the type for decoding information available as to activated isotope emission along a filament wire; and

a wand, said wand being of sufficiently small diameter to be removably juxtaposed along said nuclear reactor fuel element and to be analyzed by said radiation detector, said wand comprising:

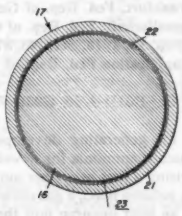
(a) a filament wire longitudinally disposed within a tubular housing of said wand composed of an activant medium, said activant medium being operative to register incident neutron flux as a long half life activated isotope along the length of said filament wire; and

(b) a sheath of converter material encasing said filament wire, said sheath being operative to produce neutron flux proportional only to incident gamma radiation in excess of a predetermined energy threshold emitted by said fuel element defined by the gamma emission of La-140 for registering said neutron flux in said filament wire as a spatial distribution of a long half life activated isotope which spatial distribution is directly proportional to the spatial distribution of fission products of said nuclear reactor fuel element.

4,200,492
NUCLEAR FUEL ELEMENT

Joseph S. Armijo, Saratoga, Calif., and Louis F. Coffin, Jr., Schenectady, N.Y., assignors to General Electric Company, San Jose, Calif.

Continuation-in-part of Ser. No. 727,183, Sep. 27, 1976, abandoned. This application Sep. 30, 1977, Ser. No. 838,161
Int. Cl.[2] G21C 3/20
U.S. Cl. 176—82 5 Claims

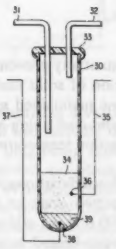


1. A nuclear fuel element which comprises an elongated composite cladding container having a zirconium alloy tube containing constituents other than zirconium in an amount greater than about 5000 parts per million and a barrier of sponge zirconium metallurgically bonded to the inside surface of the alloy tube, said sponge zirconium barrier being of thickness from about 1% to 30% of the thickness of the said alloy tube, a central core of a body of nuclear fuel material selected from the group consisting of compounds of uranium, plutonium, thorium and mixtures thereof disposed in and partially filling said container so as to leave a gap between said container and said core and an internal cavity at one end of the container an enclosure integrally secured and sealed at each end of said container and a nuclear fuel material retaining means positioned in the cavity.

4,200,493
MICROBIAL DETECTION AND ENUMERATION APPARATUS

Judd R. Wilkins, Hampton, and Glenn E. Stoner, Charlottesville, both of Va., assignors to United States of America, Washington, D.C. and University of Virginia, Charlottesville, Va.

Continuation-in-part of Ser. No. 641,279, Dec. 16, 1975, Pat. No. 4,009,078, which is a continuation-in-part of Ser. No. 543,860, Jan. 24, 1975, abandoned. This application Dec. 2, 1976, Ser. No. 747,033
Int. Cl.[2] C12K 1/10
U.S. Cl. 435—291 9 Claims

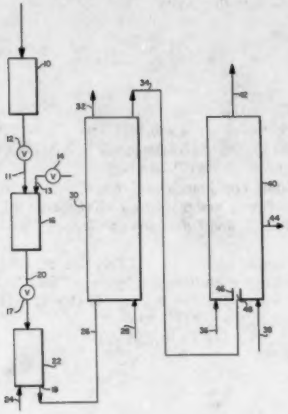


1. An apparatus for the electrochemical detection of living microorganisms in a fluid medium, which comprises: a chamber having an inlet means for introducing a fluid sample of a microorganism therein and containing a fluid growth medium suitable for the culturing of microorganisms; means attached to said chamber for drawing a vacuum within said chamber; means for sealing said inlet means which means is self-sealing after having been punctured by a means for delivering a microorganism-containing sample to said chamber; measuring electrode means fixedly attached to the exterior of said chamber, one end of which penetrates through said chamber into the interior thereof and is in contact with said fluid growth medium, about which accumulates said microorganisms thereby setting up a charge-charge interaction at said electrode, said electrode being responsive to said charge-charge interaction established at the electrode; reference electrode means fixedly attached to the exterior of said chamber, one end of which protrudes into the interior of said chamber and which is covered with a fluid growth medium permeable shielding means that prevents contact of said reference electrode with said microorganisms, said reference electrode in corporation with said measuring electrode establishing the potential of said electrochemical apparatus; and a potentiometer having an input impedance of 10^7 to 10^{10} ohms which is conductively connected to said measuring and reference electrodes.

4,200,494
METHOD OF PREVENTING DEFLUIDIZATION OF CARBONACEOUS PARTICLES

Charles R. Welter, South Charleston, W. Va.; Barry Liss, New York, N.Y.; Hubert G. Davis, Charleston, and Charles W. Albright, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 712,920, Aug. 9, 1976, which is a continuation of Ser. No. 536,843, Dec. 27, 1974, abandoned.
This application Sep. 18, 1978, Ser. No. 943,140
Int. Cl.[2] C10B *57/08, 47/24, 49/10, 49/22*
U.S. Cl. 201—9 32 Claims



1. A method of substantially preventing defluidization due to excessive agglomeration of solid carbonaceous particles in a fluid-bed reaction zone maintained at a reaction temperature above about 450° C. and containing a bed of non-agglomerating particles at the reaction temperature, said method comprising:

(a) introducing fresh solid carbonaceous particles in a carrier gas into said reaction zone at an injection velocity in excess of about 200 ft./sec., said solid carbonaceous particles having been pre-heated to a temperature essentially within the plastic transformation temperature range of said particles and being injected rapidly and directly into said reaction zone and into direct contact with the non-agglomerating particles therein;

(b) introducing a gaseous reagent into said reaction zone for fluidizing said bed and for reaction with said fresh solid carbonaceous particles at said reaction temperature within said zone,

whereby said solid carbonaceous particles are rapidly and uniformly dispersed within said bed of non-agglomerating particles so that undue agglomeration of said fresh solid carbonaceous particles and consequent bed failure are avoided, the relatively hot, fresh solid carbonaceous particles tending to minimize nozzle erosion at the high injection velocities employed.

4,200,495
PREVENTION OF DEFLUIDIZATION IN THE TREATMENT OF CAKING CARBONACEOUS SOLIDS

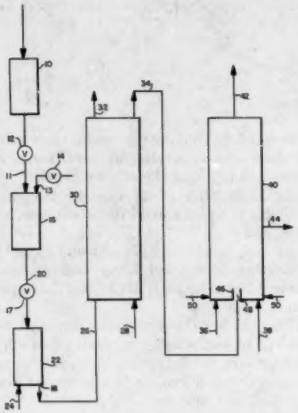
Barry Liss, New York, N.Y., and Charles R. Welter, South Charleston, W. Va.

Filed Sep. 18, 1978, Ser. No. 943,460
Int. Cl.[2] C10B *57/08, 47/24, 49/10, 49/22*
U.S. Cl. 201—9 44 Claims

1. A method for substantially preventing defluidization in a fluid-bed reaction zone maintained at a reaction temperature above 450° C. and containing a bed of non-agglomerating particles at the reaction temperature, said method comprising:

(a) introducing fresh solid carbonaceous particles in a carrier gas into said reaction zone through injection nozzle means at an injection velocity of from about 35 to about 175 ft/sec, said solid carbonaceous particles having been pre-heated to a temperature below their plastic transformation temperature and being injected directly into said reaction zone and into direct contact with the non-agglomerating particles therein:

(b) introducing a gaseous reagent into said reaction zone for fluidizing said bed and for reaction with said fresh solid carbonaceous particles at said reaction temperature within said zone; and



(c) passing a shroud gas through a shroud passage on said injection nozzle means at a velocity in excess of about 750 ft/sec, said shroud gas being employed in sufficient quantity to supply a substantial portion of the overall energy input into said reaction zone for dispersion of the fresh particles within said bed of non-agglomerating particles and for breaking up of any agglomerates of said fresh particles that may tend to form upon injection of said fresh solid carbonaceous particles into said reaction zone, whereby the high energy shroud effectively contributes to the prevention of defluidization of the bed by overcoming the agglomerating tendencies of the fresh solid carbonaceous particles.

4,200,496
VAPORIZER FOR GENERATING DEVELOPER GAS, CONTAINING AMMONIA GAS, FROM AQUEOUS AMMONIA FOR DEVELOPING DIAZO COPYING MATERIAL

Eckehard Stein, Frankfurt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 10, 1978, Ser. No. 876,670
Claims priority, application Fed. Rep. of Germany, Feb. 14, 1977, 7704348[U]
Int. Cl.[2] B01D *3/26;* G03D *7/00*
U.S. Cl. 202—153 6 Claims

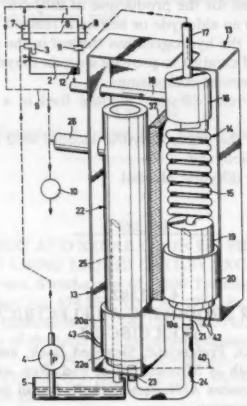
1. A vaporizer for generating developer gas, containing ammonia, from aqueous ammonia for developing diazo copying material comprising a first vaporizer unit including a rectifying column and a column head, a gas outlet for taking off the developer gas and an inlet opening into the column head for feeding in aqueous ammonia, and a heatable, steam-generating sump vessel having a base and a residual water outlet,

a second unit including a volatilizer with means for heating a base zone thereof,

a residual water inlet opening in said base zone, a residual water line connecting said residual water inlet opening to said residual water outlet of said rectifying column, said residual water outlet of said rectifying column projecting upwardly in said sump vessel and having an orifice above the base thereof,

said two units being arranged side by side with parallel axes in a single casing,

a first connecting branch as said gas outlet for taking off the developer gas and a second connecting branch as the inlet



for feeding in aqueous ammonia connected to said column head,

a suction branch connected as a suction outlet on said volatilizer,

said residual water outlet of said rectifying column, said first and second connecting branches of said vaporizer, said residual water inlet opening, and said suction branch of said volatilizer projecting from said casing,

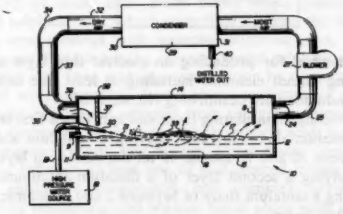
and said residual water connecting line having a section at a lower level than the base of the sump vessel and the base zone of the volatilizer.

4,200,497

SPARGED AIR DISTILLED WATER RECOVERY SYSTEM

William A. Rhodes, 4421 N. 13th Pl., Phoenix, Ariz. 85014

Filed Dec. 20, 1978, Ser. No. 971,413
Int. Cl.[2] C02B *1/06;* B01D *3/00*
U.S. Cl. 202—197 **5 Claims**



1. In a distilled water recovery system:

(a) a tank having a pair of opposed end walls and containing a body of water having an upper surface;

(b) a jet nozzle mounted in one end wall for introducing a jet of water under high pressure into said body of water below said water level;

(c) an overflow drain in said one end wall for maintaining the water level in said tank at a constant depth with respect to the structure of the tank;

(d) a duct having one end mounted in the end wall in which said overflow drain is mounted and having an open end above said water level;

(e) a blower included in said duct;

(f) a condenser connected to said duct;

(g) a distilled water drawoff member mounted in said condenser;

(h) a second duct having one end connected to said condenser and its other end opening into said tank above said water level; and

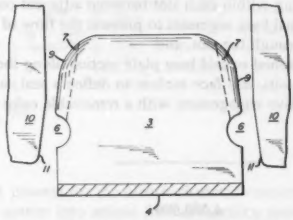
(i) a baffle mounted in said tank above said water level and located in close proximity to the open end of said second duct.

4,200,498

PRESSURE RELIEVING COKE OVEN DOOR

Julio G. Dinello, Elizabeth, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1978, Ser. No. 922,713
Int. Cl.[2] C10B *25/06, 25/16*
U.S. Cl. 202—248 **4 Claims**



1. A coke oven door comprising a vertically extended door plate and a plug thereon of substantially the area of said vertically extended plate, said plug being substantially monolithic and having vertically disposed gas channels extending along the length thereof, said vertically disposed channels being formed in the sides of said plug so that each of said vertical channels is exposed to and communicates with the interior of the coke oven along its entire length, each vertical gas channel communicating with and connected to a plurality of tributary channels, said tributary channels being formed in the respective sides of said plug so that each tributary channel is exposed to and communicates with the interior of the coke oven chamber, each of said tributary channels extending along the side of said plug toward the oven face of said plug and downwardly to form an angle of between about 15° and 45° with said vertical channels.

4,200,499

WARP-RESISTANT DOORJAMB FOR A COKE OVEN

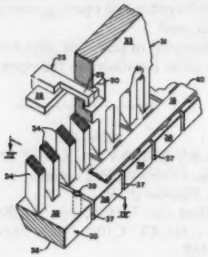
Charles C. Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1978, Ser. No. 964,100
Int. Cl.[2] C10B *25/06*
U.S. Cl. 202—248 **11 Claims**

1. A warp-resistant doorjamb apparatus for mounting next to the refractory at an outer end of a coke oven chamber to form a sealable closure with a removable coke oven door around the periphery thereof, said warp-resistant doorjamb apparatus including:

a rectangularly-shaped frame including at each vertical side an outwardly-extended rigid beam section having means to releasably engage with a coke oven door for support thereof, web sections extending at spaced-apart intervals from said rigid beam section defining window openings between each web section to minimize the conductive

transfer of heat to the rigid beam section by their thermal resistance and through dissipation of heat to the atmosphere, a base plate section extending within a single plane to form a face surface for mounting next to the refractory of the coke oven chamber, a part of said base plate section being divided by transverse slots into individual base segments each joined with at least one of said web sections for support thereby,



means extending within each slot between adjacent ones of said individual base segments to prevent the flow of coke oven gas through the slot, and

seal means attached to said base plate section along the side thereof opposite said face surface to define a seal surface for cooperative engagement with a removable coke oven door.

4,200,500

METHOD OF PREVENTING THE ADHESION OF SCALE TO THE HEATING SURFACES OF A THERMAL DESALINATION APPARATUS

Natvarlal B. Desai, Dinslaken, Fed. Rep. of Germany, assignor to Grillo-Werke Aktiengesellschaft, Duisburg and Ludwig Taprogge Reinigungsanlagen fur Rohrenwarmeaustauscher, Dusseldorf, both of, Fed. Rep. of Germany

Filed Nov. 7, 1977, Ser. No. 849,252

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1976, 2651438

Int. Cl.[2] C02B *5/06*

U.S. Cl. 203—7 **5 Claims**

1. A method of desalinating sea water comprising the steps of:

(a) heating a surface to a temperature above about 135° C.;

(b) passing a salt solution containing calcium and magnesium over said surface in the form of sea water to concentrate said solution and drive water vapor therefrom;

(c) directly reacting a polyunsaturated long-chain fatty component of a hydrocarbon chain length of C_{10} to C_{20} with carbon-to-carbon bonds exclusively along the chain and an iodine number of 80 to 200 with a maleic component consisting of maleic anhydride and/or maleic acid at a temperature of 150° to 200° C. in the absence of solvent and catalyst and in a weight ratio of said fatty component to said maleic component of 1:1 to 1:2.5 for a period of thirty minutes to five hours, said fatty component being a compound having a terminal carboxyl, ester or alcohol group;

(d) hydrolyzing the reaction produce of said fatty component with said maleic component in aqueous sodium hydroxide; and

(e) introducing the hydrolyzed reaction product into said salt solution in a substoichiometric amount up to 100 parts per million and sufficient to prevent the deposition of calcium and magnesium scale on said surface.

4,200,501

SILICATE FOULING CONTROL DURING DIHYDRIC ALCOHOL DISTILLATION

Edward J. Panek, Trenton, Mich.; Werner O. Moll, Baton Rouge, La.; Lee H. Bergman, Grosse Ile, and Siegfried P. Kersten, Trenton, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Mar. 24, 1978, Ser. No. 889,778

Int. Cl.[2] B01D *3/34;* **C07C** *29/26*

U.S. Cl. 203—7 **6 Claims**

1. In a method for controlling silicate precipitation in a distillation process for the production of dihydric alcohols of the type wherein an aldehyde or ketone is reacted with acetylene followed by the hydrogenation thereof in the presence of a silica supported catalyst to provide a crude dihydric alcohol feed, the improvement comprising:

distilling the crude dihydric alcohol feed in a distillation column,

admixing with the crude dihydric alcohol feed an aqueous caustic solution, and

recovering the dihydric alcohol.

4,200,502

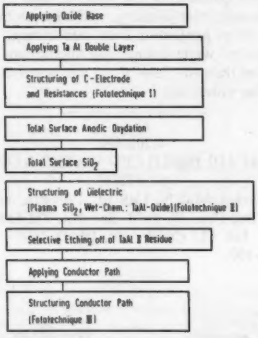
METHOD FOR PRODUCING AN ELECTRICAL THIN LAYER CIRCUIT

Wolf-Dieter Münz, Freigericht; Siegfried Bock, and Hans W. Pötzlberger, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1979, Ser. No. 19,437

Int. Cl.[2] C25D *11/02, 11/34;* **H01C** *17/06;* **H05K** *3/00*

U.S. Cl. 204—15 **10 Claims**


Applying Oxide Base
Applying Ta Al Double Layer
Structuring of C-Electrode and Resistances (Fototechnique I)
Total Surface Anodic Oxydation
Total Surface SiO_2
Structuring of Dielectric (Plasma SiO_2, Wet-Chem.: TaAl-Oxide) (Fototechnique II)
Selective Etching off of TaAl II Residue
Applying Conductor Path
Structuring Conductor Path (Fototechnique III)

1. A method for producing an electric thin layer circuit comprising circuit elements including at least one capacitor and a conductor path comprising the steps of:

(a) providing an insulating layer and applying a first layer of a tantalum-aluminum alloy having a tantalum share of between 30 and 70 atomic % on the insulating layer;

(b) applying a second layer of a tantalum-aluminum alloy having a tantalum share of between 2 and 20 atomic % on the first layer;

(c) forming circuit elements by a first masking and etching technique by etching off areas of the first and second layers outside the circuit elements by at least one etching;

(d) anodically oxidizing an exposed surface of the first and second layers to form a tantalum-aluminum oxide layer and coating the anodically oxidized surface with a silicon dioxide layer;

(e) removing by a second masking and etching technique not-required areas of the silicon dioxide layer external to the capacitor;

(f) by utilizing the remaining silicon dioxide layer as an etching mask, selectively etching off the not-required areas of the tantalum-aluminum oxide layer and the second tantalum-aluminum layer external to the capacitor; and

(g) by a third etching and masking technique applying a conductive surface layer over the silicon dioxide layer at the capacitor element to form a two-layer dielectric capacitor and over the first tantalum-aluminum layer to form the conductor path.

4,200,503

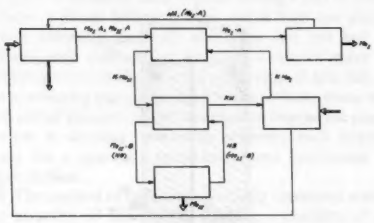
Patent Not Issued For This Number

4,200,504

EXTRACTION AND SEPARATION OF METALS FROM SOLIDS USING LIQUID CATION EXCHANGERS

Gunnar Thorsen, Steinhaugen 41, 7000 Trondheim, Norway

Division of Ser. No. 474,853, May 30, 1974, Pat. No. 4,008,134.
This application Feb. 14, 1977, Ser. No. 768,470
The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.
Int. Cl.[2] C25G *1/08*; C01G *3/00, 49/00, 53/00*
U.S. Cl. 204—108 **13 Claims**



1. A process for the hydrometallurgic production of at least one desired metal consisting of copper, nickel, cobalt or zinc, from an iron-containing raw material selected from the group consisting of oxide ores, metal oxide waste products and roasted sulphide ores, which comprises leaching the iron-containing raw material with aqueous sulphuric acid, thereby forming an iron-containing aqueous metal sulphate solution, extracting iron from said aqueous solution by contacting said solution with an organic liquid phase consisting of a cation exchanger component selected from the group consisting of organic carboxylic acids and alkyl phosphoric acids in solution in an organic solvent, said organic liquid phase containing a complex between at least one of said desired metals and the cation exchanger component, said complex having been formed by contacting said organic liquid phase with a desired metal-containing material which is different from the starting iron-containing raw material to be leached, whereby iron is transferred to the organic phase and forms a complex with the cation exchanger component and the desired metal of said complex passes from the organic phase to said aqueous sulphate solution, and then recovering desired metals from said aqueous sulphate solution.

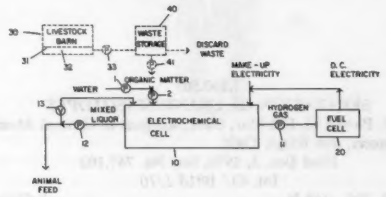
7. A process according to claim 1, wherein the desired metals are recovered from the aqueous sulphate solution, after extraction of iron, in metallic form by electrolysis.

4,200,505

ELECTROCHEMICAL CONVERSION OF ORGANIC MATERIAL

Donald L. Day, 2409 John Dr., Urbana, Ill. 61801, and Marvin P. Steinberg, 40 O'Connor Ct., Champaign, Ill. 61820

Filed Apr. 3, 1979, Ser. No. 26,666
Int. Cl.[2] C02C *5/12*
U.S. Cl. 204—149 **10 Claims**



1. A process for the electrochemical conversion of organic waste matter into animal feed comprising passing an aqueous mass of biodegradable organic matter comprising aerobic bacteria and having a total solids content of at least about 0.3% by weight and a biochemical oxygen demand of at least about 1,000 milligrams per liter in to an electrolytic cell, subjecting said aqueous mass to electrochemical action in said cell by passing DC current therethrough to form hydrogen bubbles at the cathode of said cell, to maintain the anode of said cell essentially free of oxygen bubble formation, and to effect the growth of said aerobic bacteria, continuing said electrochemical treatment of said aqueous mass until said mass is essentially free of odors of said organic matter starting material, during said electrochemical treatment collecting said hydrogen formed, utilizing at least a portion of the said collected hydrogen to provide a portion of the electric requirements of said cell, and recovering from said cell an aerobic bacteria-rich effluent consumable by animals.

4,200,506

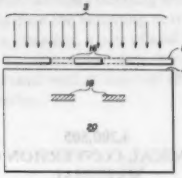
PROCESS FOR PROVIDING IDENTIFICATION MARKINGS FOR GEMSTONES

Gisela A. M. Dreschhoff, and Edward J. Zeller, both of 2908 W. 19th St., Lawrence, Kans. 66044

Filed Nov. 8, 1977, Ser. No. 849,571
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—157.1 H **12 Claims**

11. A method of providing permanent identification markings within the interior of a diamond crystal lattice comprising irradiating the diamond by means of a proton bombardment through a proton mask etched in the pattern of the identification mark; said protons being applied within an energy range of about 0.25 MeV to about 4 MeV; said diamond crystal being

cooled to the temperature of liquid nitrogen during the irradiating period; whereby the area of the crystal in which the



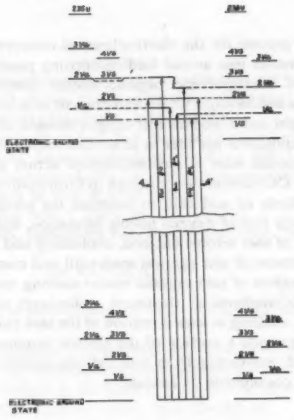
proton stops is transformed into amorphous carbon or graphite.

4,200,507

SEPARATION OF URANIUM ISOTOPES

John T. Porter, II, Del Mar, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Dec. 3, 1976, Ser. No. 747,102
Int. Cl.[2] B01J *1/10*
U.S. Cl. 204—158 R 7 Claims



1. A method for separating uranium isotopes comprising the steps of providing a solid, crystalline, uranyl salt source material which is photochemically reactive to reduce uranyl cations to tetravalent uranium ions, selectively irradiating said photochemically reactive uranyl source material at an electronic absorption wavelength in the range from about 20,000 to about 27,000 cm^{-1} which is selective to a desired isotope of said uranyl source material at an effective cryogenic temperature for isotope spectral line splitting below about 77° K., without substantial photochemical reduction of the source material at cryogenic temperature, further irradiating said source material within the fluorescent lifetime of the selectively irradiated source material to selectively photochemically reduce the selectively excited isotopic species from UO_2^{+2} to tetravalent U^{+4}, and chemically separating the reduced tetravalent isotope species from the remaining uranyl salt compound.

4,200,508

METHOD AND COMPOSITION FOR DETECTING ANTIGENIC SUBSTANCES

Hidematsu Hirai, Kita 15-jo Nishi 7-chome, Kita-ku, Sapporo-shi, Hokkaido, Japan

Filed Feb. 9, 1978, Ser. No. 876,552
Claims priority, application Japan, Feb. 9, 1977, 52/13183
Int. Cl.[2] G01N *27/26, 33/00;* A61K *43/00*
U.S. Cl. 204—180 G 28 Claims

1. A method of detecting an antigen by immunodiffusion which comprises:

(A) preparing a mixture of a support and an antibody against said antigen;

(B) coating said mixture on a plate;

(C) forming holes in said coating;

(D) applying test sample to said holes in the presence of enzyme-labeled antigen;

(E) conducting immunodiffusion to thereby obtain migration of the resulting antigen-antibody complex;

(F) contacting said coated plate with a chromophore and a developing agent, whereby a measurable visible indication of the extent of migration is produced by the coupling of said enzyme and said chromphore; and

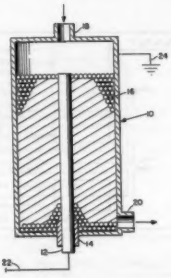
(G) measuring the extent of migration of said complex.

4,200,509

METHOD FOR DEWAXING REFINED VEGETABLE OILS FOR REFRIGERATOR CLARITY STABILITY

Edward S. Seguine, Fairfield, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 972,643, Dec. 22, 1978. This application Jun. 27, 1979, Ser. No. 52,366
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—186 14 Claims



1. A method of dewaxing a refined vegetable oil, free of significant amounts of dispersed water, to provide a dewaxed liquid vegetable oil having excellent refrigerator clarity, said method comprising the steps of:

(a) tempering said refined vegetable oil at a sufficiently cool temperature until said waxes nucleate and begin crystal growth, wherein said nucleation temperature is from about 25° C. to about 50° C., and wherein said oil is tempered for at least about 12 hours,

(b) growing said nucleated wax crystals at an appropriately cool temperature until said wax crystals are large enough to be electrostatically removed by dielectrophoretic filtration, wherein said growing temperature is no higher than about 28° C. for at least about 1 hours, and

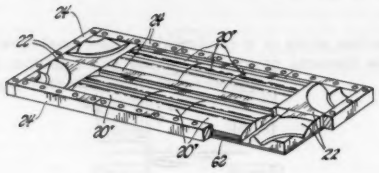
(c) passing said cooled oil of step (b) through an electrofilter at an appropriate flow rate sufficient to trap said crystallized waxes in said electrofilter to provide said dewaxed vegetable oil having excellent refrigerator clarity, said electrofilter comprising an electrostatic field and a wax trapping filter means for dielectrophoretic filtration.

4,200,510

ASSEMBLY AND METHOD TO EXTEND USEFUL LIFE OF SPUTTERING TARGETS

Lawrence E. O'Connell, Doylestown, and George F. Nichols, Springtown, both of Pa., assignors to Delbar Products, Inc., Perkasie, Pa.

Filed Mar. 19, 1979, Ser. No. 21,410
Int. Cl.[2] C23C 15/00
U.S. Cl. 204—192 R 10 Claims



1. A metal cathode assembly including a conductive metal base plate, a plurality of consumable metal target members mounted upon said base plate, said target members being arrayed on said base plate to include two sets of longitudinally spaced end targets and a plurality of intermediate end-to-end abutting targets disposed between said end targets, said abutting targets coacting to provide an enclosed and continuous length of consumable metal, each intermediate target comprising a pair of elements, each element having a pair of planar end surfaces, a planar bottom surface and at least one planar side surface extending generally normal to said end and bottom surfaces, each element also including a convex upper surface extending transversely from the upper edge of said side surface and terminating proximate said bottom surface, means securing each pair of elements to the base plate to dispose the planar side surfaces in abutting relationship whereby each intermediate target has a generally symmetrical and continuous convex upper surface.

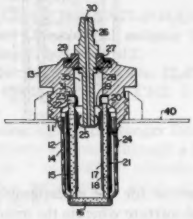
8. The method of restoring a partially consumed metal cathode assembly of the type comprising a plurality of initially solid and rectangularly shaped metal targets mounted in abutting relationship on a conductive base plate so as to form an enclosed and continuous length of consumable metal, said assembly comprising two sets of end targets transversely joining two rows of aligned and abutting intermediate targets, the assembly having been eroded in use to result in a continuous oval-like narrow groove extending through said targets, the groove in the intermediate target rows being linear and of a double convex configuration in cross section with the deepest part of the groove being generally midway of the width of the intermediate targets, the groove in said end targets also being of a double convex section and curved to join the linear groove portions, the method comprising: disconnecting said targets from said base plate, severing each intermediate target along the deepest part of said groove to form a pair of target elements, reversing and reattaching said target elements to said base plate so that the thickest portions of said elements are in abutting contact thereby providing each target with a generally symmetrical and continuous convex upper surface, and rotating each end target through 180° upon its base to position the thickest portions thereof in abutting relationship to the endmost intermediate targets whereby the thickest portions of said severed and repositioned targets are disposed in the area formerly occupied by said eroded groove.

4,200,511

DEVICE FOR ELECTROCHEMICALLY MEASURING THE CONCENTRATION OF OXYGEN IN COMBUSTION GASES

Kanemasa Sato; Sadayasu Ueno, both of Katsuta, and Norio Ichikawa, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 25, 1978, Ser. No. 909,520
Claims priority, application Japan, May 27, 1977, 52/61188
Int. Cl.[2] G01N 27/46
U.S. Cl. 204—195 S 13 Claims



1. A device for electrochemically measuring the concentration of oxygen in combustion gases comprising:

a. a supporting member formed therein with a cylindrical axial central bore;

b. a first cylindrical member, having inner and outer surfaces, formed of an ion-conducting solid electrolyte, said first cylindrical member being arranged concentrically at one open end thereof in the axial central bore formed in said supporting member and maintained in contact with said supporting member in a portion of an inner wall surface of the latter defining the axial cenral bore so as to block fluid communication between said supporting member and said first cylindrical member, said first cylindrical member being open at both ends;

c. a first electrode formed on an inner surface of said first cylindrical member;

d. a second electrode formed on an outer surface of said first cylindrical member;

e. a first terminal member arranged concentrically in the axial central bore formed in said supporting member and being electrically connected to said first electrode, said first terminal member being formed therein with an axial central bore through which atmosphere can be supplied to the interior of the first cylindrical member;

f. a second terminal member connected to said second electrode;

g. a second cylindrical member having a closed end portion and surrounding said first cylindrical member, said second cylindrical member being arranged concentrically in the axial central bore formed in said supporting member and supported thereby, said second cylindrical member being formed in its wall with a multitude of openings for supplying combustion gases therethrough to the exterior of said first cylindrical member, said closed end portion having a raised bottom portion disposed inwardly of said first cylindrical member; and

h. an annular channel formed in said closed end portion of said second cylindrical member having therein the other open end of said first cylindrical member.

4,200,512

ELECTROCHEMICAL DETECTION OF PHOSGENE IN GAS MIXTURES

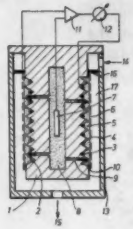
Otto Petersen, and Hans-Dieter Schmidt, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1977, Ser. No. 804,696

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627487

Int. Cl.[2] G01N 27/46

U.S. Cl. 204—195 R 6 Claims



1. In an apparatus for the polarographic measurement of phosgene in a gas mixture wherein the improvement comprises a polarographic cell containing at least two electrodes and an electrolyte in the cell containing up to 15% by weight of water and formamide which reacts with phosgene to produce a reaction product including HCN the polarographic measurement of which is unaffected by the other gases in the gas mixture whereby a current is obtained which is proportional to the concentration of phosgene.

4,200,513

DEVICE FOR REDUCING MAGNETIC DISTURBANCES IN SERIES OF VERY HIGH INTENSITY ELECTROLYSIS CELLS

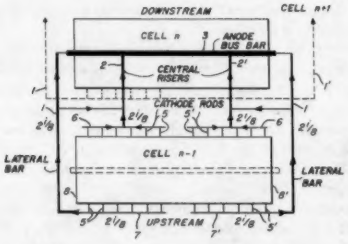
Paul Morel, Le Vesinet, and Jean-Pierre Dugois, Saint-Jean-de-Maurienne, both of France, assignors to Aluminum Pechiney, Lyons, France

Filed Jul. 27, 1978, Ser. No. 928,607

Claims priority, application France, May 29, 1978, 78 16808

Int. Cl.[2] C25C 3/16, 3/06

U.S. Cl. 204—243 M 2 Claims



1. A device for supplying electric current between very high intensity electrolysis cells connected in series, for the purpose of reducing magnetic distrubances, wherein each cell is oriented transversely to the axis of the series, and each cell includes an anode bus bar, a plurality of cathode output rods, and at least one central riser for coupling cathode output rods from an upstream cell to an anode bus bar of a downstream cell, comprising means for supplying electrical current through the two ends of said anode bus bar and through said at least one central riser, and wherein the fraction of the total current intensity (I) supplying each end of the anode bus bar is between I/8 and 2I/8.

4,200,514

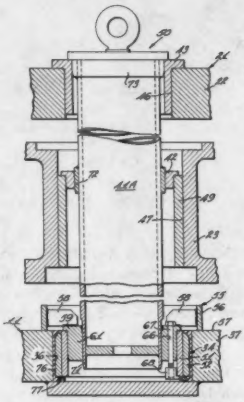
METHOD AND APPARATUS FOR THE ALIGNING AND INSTALLATION OF WICKET GATE BUSHINGS IN A UNITIZED STAY RING-DISCHARGE RING OF A HYDRO-TURBINE MACHINE

Robert G. Schaale, York, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 13, 1978, Ser. No. 969,240

Int. Cl.[2] B29C 5/00; B29D 3/00

U.S. Cl. 264—262 7 Claims



1. A method for aligning bushings in two spaced openings, the bushings being inserted at different times, comprising:

placing a bushing assembly which is desired to be located in the opening in a first member in substantially axial alignment with a bushing in the other opening;

inserting a clamping fixture within the bushing assembly;

clamping the bushing assembly to the clamping fixture;

inserting an alignment bar through the bushing in the opening in the second member and into the clamping fixture to effect radial movement of the clamping fixture and thereby align the bushing assembly clamped thereto with the axis of the aligning bar;

fixing the bushing assembly in its aligned positioned within the opening in the first member.

4,200,515

SINTERED METAL POWDER-COATED ELECTRODES FOR WATER ELECTROLYSIS PREPARED WITH POLYSILICATE-BASED PAINTS

Dale E. Hall, Monroe, and Ernest L. Huston, Tuxedo Park, both of N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

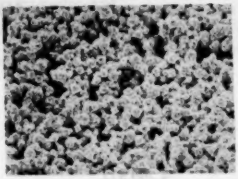
Filed Jan. 16, 1979, Ser. No. 3,856

Int. Cl.[2] C25B 11/04

U.S. Cl. 204—290 R 5 Claims

1. An electrode for water electrolyzers comprising an electrically conductive support surface having a porous metallurgically bonded layer of metal about 50 to 150 μm thick comprised of particles from the group of nickel, nickel-iron alloys, iron and iron-carbon alloys said particles being in the size range of about 2 to 30 μm and being sintered together to a theoretical density of about 50% in such manner as to retain individual particle appearance while being adhered to at least part of said support surface, said porous metallurgically bonded layer comprising nickel and nickel-iron alloys containing at least 10% nickel and having a hydrated, electrochemi-

cally formed layer of oxide, incorporating metal of said metallurgically bonded layer on the external and internal surfaces of



said porous layer when said electrode is an anode and said porous metallurgically bonded layer being saturated with hydrogen when said electrode is a cathode.

4,200,516

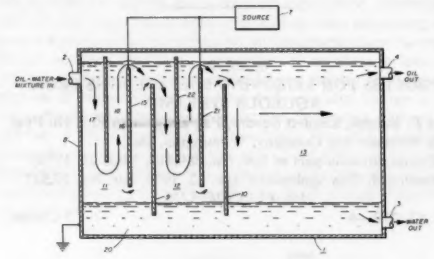
ELECTROSTATIC COALESCING SYSTEM

Kenneth E. Pope, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jul. 28, 1978, Ser. No. 929,045

Int. Cl.² C10G *33/02*

U.S. Cl. 204—302 **7 Claims**



1. An electrostatic coalescing system for a polar fluid dispersed as drops in a mixture, including less polar fluids, including,

a vessel adapted to receive a mixture of fluids in which the more polar of the fluids is dispersed in the form of drops,

an electrode mounted within the fluid mixture passed through the vessel and adapted to be connected to a source of potential,

a second electrode mounted in the mixture of the fluids and spaced from the driven electrode to establish an electrostatic field between the electrodes,

a source of potential connected to the driven electrode to generate the electrostatic field between the electrodes,

an electrically conductive body, placed between the driven electrode and second electrode and shaped to establish two zones in the electrostatic field, through which the fluid mixture received by the vessel flows, in sequence, through the zones, and

a means for directing polar fluid coalesced in the two zones into a collection below the electrostatic field for common withdrawal from the vessel, whereby the electrostatic field in the first zone decreases in strength as the content of polar fluid of the incoming mixture increases, resulting in an increase in strength of the electrostatic field in the second area.

4,200,517

TREATMENT OF HYDROCARBON-CONTAINING MINERAL MATERIAL

Franklin S. Chalmers, Bethesda, Md.; Charles A. Czako, Seven Hills, and Carl J. Nelson, Lakewood, both of Ohio, assignors to Arthur G. McKee & Company, Independence, Ohio

Filed Dec. 5, 1977, Ser. No. 857,131

Int. Cl.² C10G *1/00*; C10B *47/20, 1/10, 1/06*

U.S. Cl. 208—11 R **26 Claims**

18. The process of claim 15 in which preheated air is supplied to said coke burn-off zone for combustion purposes, and in which said air is preheated by direct transfer of heat to said air from hot combustion gases emanating from said coke burn-off zone.

4,200,518

HEAT EXCHANGER ANTI-FOULANT

Paul K. Mulvany, New Orleans, La., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 22, 1979, Ser. No. 22,672

Int. Cl.² C10G *9/16, 7/00*; C10L *1/10*

U.S. Cl. 208—48 AA **9 Claims**

1. A process for reducing heat exchanger fouling in which a liquid hydrocarbon stream is passed through a heat exchanger at a temperature from 0° to 1500° F. wherein from 1 to 500 parts per million of a polyalkylene amine is added to said hydrocarbon stream.

4,200,519

PROCESS FOR THE PREPARATION OF GAS OIL

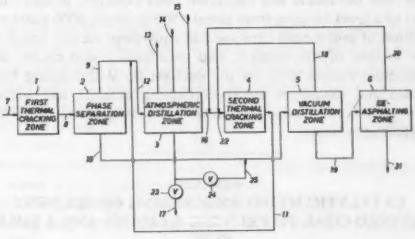
Pieter B. Kwant, Amsterdam; Dirk Kanbier, The Hague; Petrus W. H. L. Tjan, Amsterdam, and Mohammed Akbar, The Hague, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 29, 1979, Ser. No. 43,195

Claims priority, application Netherlands, Jul. 7, 1978, 7807356

Int. Cl.² C10G *37/02*

U.S. Cl. 208—77 **6 Claims**



1. A process for the preparation of gas oil from an asphaltenes-containing hydrocarbon oil by thermal cracking, wherein

(a) thermally cracking said asphaltenes-containing oil in a first thermal cracking zone at a temperature from about 400° to 500° C. and a pressure from about 1 to about 30 bar, to obtain a first cracked product comprising 10 to 30 %w on said asphaltenes-containing oil of material boiling at a temperature lower than the boiling range of said asphaltenes-containing oil,

(b) separating the product of step (a) by flashing in a phase separation zone into

(i) a light fraction boiling substantially below 500° C. which contains in addition to components boiling below 350° C., additional components boiling between 350° and 500° C., and

(ii) a heavy fraction boiling substantially above 350° C. which contains in addition to components boiling above

500° C., additional components boiling between 350° and 500° C.,

(c) separating the heavy fraction from step (b) by fractionation distillation in a vacuum distillation zone into a vacuum distillate fraction and a vacuum residue,

(d) deasphalting the vacuum residue from step (c) in a deasphalting zone into a deasphalted oil and bitumen,

(e) separating the light fraction from step (b) by fractionation distillation in an atmospheric distillation zone into at least one light distillate fraction, a heavy distillate fraction and an atmospheric residual fraction,

(f) passing the vacuum distillate fraction from step (c) and the deasphalted oil from step (d) to step (g),

(g) thermally cracking the heavy distillate fraction from step (e) in admixture with components from step (f) in a second thermal cracking zone at a temperature from about 400° to 550° C. and a pressure from about 1 to 30 bar to obtain a second cracked product comprising from 20 to 75 %w of components boiling below the boiling range of said asphaltenes-containing oil feed to step (a), and

(h) withdrawing said at least one light distillate fraction from step (e).

4,200,520
CATALYTIC CRACKING PROCESS

Elroy M. Gladrow, and William E. Winter, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 30, 1978, Ser. No. 873,106
Int. Cl.[2] C10G *11/04;* B01J *8/24*
U.S. Cl. 208—120 **9 Claims**

1. In a catalytic cracking process unit wherein a gas oil feed is cracked in a cracking zone at an elevated temperature in the presence of a cracking catalyst, the cracking catalyst is regenerated in a regeneration zone by burning coke off the catalyst, and catalyst is circulated between the cracking zone and the regeneration zone, the improvement for obtaining a naphtha product of improved octane number comprising introducing sufficient of a nickel and vanadium metals-containing heavy feedstock with said gas oil feed introduced into the cracking zone to deposit nickel and vanadium metals on said catalyst and raise the nickel and vanadium metals-content of said catalyst to a level ranging from about 1500 to about 6000 parts per million of said metals expressed as equivalent nickel, based on the weight of the catalyst, and maintaining said nickel and vanadium metals level on the catalyst by withdrawing high nickel and vanadium metals-containing catalyst and adding low nickel and vanadium metals-containing catalyst to the regeneration zone.

4,200,521
CATALYTIC HYDROPROCESSING OF SOLVENT REFINED COAL TO PROVIDE A LIQUID AND A SOLID FUEL

Thomas R. Stein, Cherry Hill; Roland H. Heck, West Deptford, and Michael J. Dabkowski, Mantua, all of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 7, 1978, Ser. No. 913,478
Claims priority, application United Kingdom, Jul. 26, 1977, 31308/77
Int. Cl.[2] C10G *23/02*
U.S. Cl. 208—216 PP **4 Claims**

1. A method for hydroprocessing a blend of solvent refined coal with recycle solvent to yield a liquid fuel product of reduced sulfur, nitrogen and oxygen content and enhanced hydrogen to carbon ratio and a solid fuel of low ash and low sulfur content which comprises blending solvent refined coal with a quantity of recycle solvent less than the quantity of solvent refined coal, contacting hydrogen with the blend of solvent refined coal and a quantity of recycle solvent less than the quantity of said solvent refined coal and with a porous catalyst of hydrogenation metals on a porous support wherein the major portion of the pore volume of said catalyst is constituted by pores of less than 100 A diameter at a hydroprocessing conditions of 650° F. to 850° F., pressure of at least about 500 psig and space velocity of about 0.1 to 3 LHSV and separately recovering from said contacting a hydrotreated liquid product of reduced sulfur, nitrogen and oxygen content and enhanced hydrogen to carbon ratio and a solid fuel of low ash and low sulfur content.

4,200,522
PROCESS FOR THE FLOTATION OF ORES

Wim Dorrepaal, and Gerardus M. van den Haak, both of Bodegraven, Netherlands, assignors to CHEM-Y, Fabriek van chemische produkten B.V., Bodegraven, Netherlands

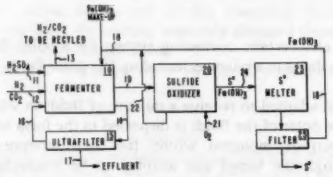
Continuation-in-part of Ser. No. 727,863, Sep. 29, 1976, abandoned. This application Jan. 18, 1978, Ser. No. 872,030
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—166 **10 Claims**

1. A process for the flotation of salt-type minerals and oxide ores comprising using as collector a mixture consisting essentially of a major amount of a fatty acid type collector and a minor amount of a monoester of an acid chosen from the group consisting of orthophthalic and maleic acids with at least one alcohol chosen from the group consisting of alkanols having at least 8 and no more than 14 carbon atoms and oleyl alcohol, and alkanol mixtures containing an average of 8 through 14 carbon atoms the free acid group of said mono-ester remaining unneutralized.

4,200,523
PROCESS FOR REMOVING SULFATE IONS FROM AQUEOUS STREAMS

Jean L. Balmat, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 889,563, Mar. 23, 1978, abandoned. This application Apr. 12, 1979, Ser. No. 29,527
Int. Cl.[2] C02C *5/10*
U.S. Cl. 210—4 **7 Claims**



1. A process for removing dissolved sulfate ions from an aqueous stream comprising the steps of

(a) contacting the sulfate-containing stream which is essentially free of organic materials with at least 4 gram moles of gaseous hydrogen per gram-ion of sulfate, at least 0.05 gram mole of gaseous CO_2 per gram-ion of sulfate, and an aqueous anaerobic mixed liquor containing group Desulfovibrio sulfate-reducing bacteria, trace nutrients, and a suspension of calcium carbonate to maintain a mixed liquor pH of between about 5.5–8, said contacting conducted at a temperature between 0° and 60° C. for a time sufficient to convert the sulfate ions to sulfide ions;

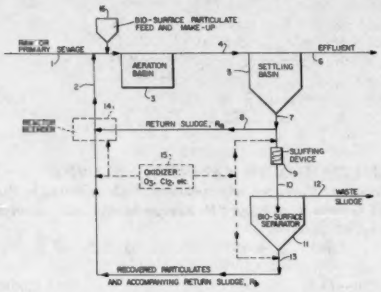
(b) removing the sulfide ions from the mixed liquor by transforming them into either a vapor or solid phase; and

(c) separating the sulfide-containing phase from the mixed liquor.

4,200,524
BIO-SURFACE SEPARATION PROCESS

Gilbert V. Levin, Chevy Chase, Md., assignor to Biospherics Incorporated, Rockville, Md.

Filed Oct. 25, 1978, Ser. No. 954,534
Int. Cl.[2] C02C 1/04
U.S. Cl. 210—5 3 Claims

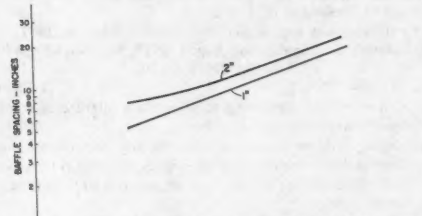


1. An activated sludge sewage treatment process which comprises mixing influent sewage material with activated sludge and bio-surface particulates to provide a mixed liquor, passing said mixed liquor to an aeration zone wherein it is contacted with an oxygen-containing gas to reduce the BOD content thereof, passing the mixed liquor to a settling zone in which it is settled to separate bio-surface particulates having sludge adherent thereto and a clarified supernatant, removing said clarified supernatant from said settling zine, subjecting at least a portion of the separated bio-surface particulates having sludge adherent thereto to a treatment to separate at least a portion of the adherent sludge therefrom, passing the treated portion of bio-surface particulates and separated sludge to a bio-surface particulate-sludge separator, separating at least a portion of the sludge which is essentially free of bio-surface particulates, removing it from said bio-surface particulate separator and passing it to waste, and recycling the bio-surface particulates and remaining sludge for mixing with said influent sewage material.

4,200,525
LIQUID EXTRACTION PROCESS AND APPARATUS FOR ACCOMPLISHING THE SAME

Andrew E. Karr, Bloomfield, N.J., assignor to Chem-Pro Equipment Corp., Fairfield, N.J.

Filed Apr. 3, 1978, Ser. No. 892,891
Int. Cl.[2] B01D 11/00
U.S. Cl. 210—21 4 Claims



BAFFLE SPACING FOR 1" & 2" PLATE SPACING

1. In a process for liquid extraction using counterflowing liquid phases in a reciprocating plate extraction column, the improvement comprising spacing in at least a portion of the column a plurality of plates relative to one another according to the equation:

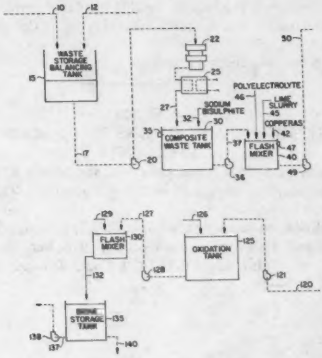
$$l\alpha \frac{(U_D + 0.67\ U_C)^{2.5}}{(\Delta\rho)^{5/3}\ \sigma^{1.5}}$$

wherein l is the relative plate spacing in different portions of the extraction column, U_D is the superficial velocity of the dispersed phase at flooding, U_C is the superficial velocity of the continuous phase at flooding, $\Delta\rho$ is the density difference and σ is the interfacial tension between the counterflowing phases.

4,200,526
PROCESS FOR TREATING WASTE WATER

Earl W. Johnson, West Chester; Malcolm J. Reider; Robert Anewalt, both of Reading, and Harry J. Kring, Mohnton, all of Pa., assignors to Gerber Products Company, Fremont, Mich.

Filed Mar. 6, 1978, Ser. No. 884,099
Int. Cl.[2] C02B 1/20
U.S. Cl. 210—23 H 7 Claims



1. A process for treating textile plant waste water containing at least 50 ppm surface active agent consisting essentially of:

adding iron salt as the sole chemical reagent in an amount sufficient to enable the turbidity to be subsequently adjusted to less than 10 JTU;

adding lime slurry in an amount sufficient to adjust the pH of the waste water to about 8.0–9.5;

allowing sufficient solids to precipitate from the pH adjusted waste water to achieve said turbidity;

separating effluent from said precipitated solids;

passing said separated effluent through at least one sand filter;

adjusting the pH of the filtered effluent to below about 6.0; and

subjecting said pH adjusted filtered effluent to reverse osmosis.

4,200,527
TREATING CHROME TANNING BATH RECYCLE STREAM

Vincent J. Cassella, Crystal Lake, Ill., and Mazin R. Irani, Norristown, Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 891,233, Mar. 29, 1978, abandoned. This application Oct. 20, 1978, Ser. No. 953,245
Int. Cl.[2] C02B 1/20; C02C 3/06
U.S. Cl. 210—49 14 Claims

1. A method for removing suspended solids from an exhausted chrome tanning bath while retaining chrome values, comprising the steps of:

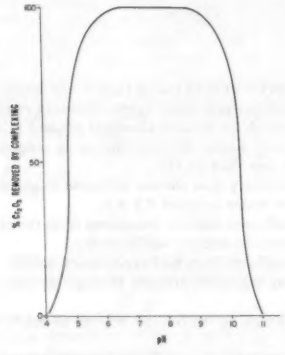
(a) agitating an aqueous solution containing chromium ions, suspended solids and a pH of 2 to 4.5;
(b) adding sufficient hydrated amorphous magnesium silicate to said agitating solution to flocculate said suspended solids;
(c) containuing said mixing for a period of time sufficient for flocculants to form;
(d) separating said flocculated solids from the supernatant; and
(e) recovering the supernatant containing the chromium (III) ions.

13. A method for flocculating suspended solids in acid medium, comprising the steps of:
(a) agitating an aqueous solution containing suspended solids and having a pH between 2 and 4.5;
(b) adding 0.1 to 0.35% by weight of magnesium silicate to said agitating solution thereby causing said suspended solids to flocculate, said magnesium silicate being amorphous, and having a mole ratio (SiO_2/MgO) of 1.75/1.0 to 4.50/1.0, an average particle size of 10 to 15 microns, a surface area of 35 to 65 m^2/g, a bulk density of 0.40 to 0.75 g/cc, a weight loss at 105° C. of 5 to 15% and an ignition loss of 10 to 30%;
(c) continuing the mixing until flocculants form;
(d) separating the flocculated solids from the supernatant; and
(e) recovering the supernatant.

4,200,528
REMOVING METAL IONS FROM AQUEOUS EFFLUENTS

Vincent J. Cassella, Crystal Lake, Ill., and Mazin R. Irani, King of Prussia, Pa., assignors to PQ Corporation, Valley Forge, Pa.

Continuation-in-part of Ser. No. 891,232, Mar. 29, 1978, abandoned. This application Dec. 13, 1978, Ser. No. 968,938
Int. Cl.² C02B *1/20*; C02C *5/02*
U.S. Cl. 210—49 **16 Claims**



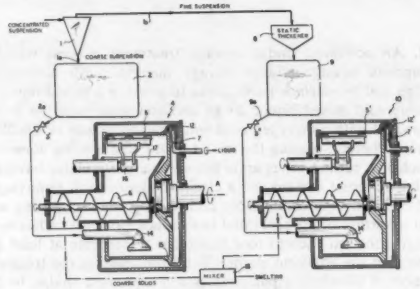
1. A method for removing metal ions from aqueous effluents comprising the steps of adding amorphous, hydrated magnesium silicate while adjusting or maintaining the pH in a region that favors the formation of an insoluble metal-magnesium silicate complex to agitating aqueous effluent; agitating the effluent-magnesium silicate mixture for a period sufficient to allow formation of a metal-magnesium silicate complex; and separating said complex from the effluent, said magnesium silicate being characterized by:
Mole Ratio SiO_2/MgO—1.75 to 4.50
Average Particle Size (microns)—10 to 55
Surface Area (m^2/g)—35 to 65
Bulk Density tamped (g/cc)—0.40 to 0.75
Weight Loss at 105° C. (%)—5 to 15
Ignition Loss (%)—10 to 30

11. The method of removing trivalent chromium ions from tannery effluent by the steps of adding amorphous, hydrated magnesium silicate and adjusting or maintaining the pH at 5.3 to 9.8 to agitating tannery effluent, agitating the effluent-magnesium silicate mixture for a period sufficient to allow complexing of the chromium ions and separating the magnesium silicate from the effluent, said magnesium silicate being characterized by:
Mole Ratio SiO_2/MgO—1.75 to 4.50
Average Particle Size (microns)—10 to 55
Surface Area (m^2/g)—35 to 65
Bulk Density Tamped (g/cc)—0.40 to 0.75
Weight Loss at 105° C. (%)—5 to 15
Ignition Loss (%)—10 to 30

4,200,529
METHOD OF DEWATERING A SLURRY

Eugen Fink, and Eberhard Krennwallner, both of Munich, Fed. Rep. of Germany, assignors to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,015
Int. Cl.² B01D *33/10*
U.S. Cl. 210—73 R **10 Claims**



1. A method of dewatering a copper-ore slurry, said method comprising the steps of:
separating said slurry into a fine suspension having a relatively fine solid phase having a mesh size of at most 10 microns and a coarse suspension having a relatively coarse solid phase having a mesh size greater than 10 microns;
centrifuging said coarse suspension to separate the solid and liquid phases thereof solely by mechanical means; and
separately separating said fine suspension into the solid and liquid phases thereof solely by mechanical means.

4,200,530
ROTARY FILTER

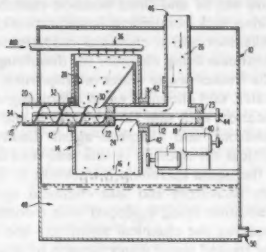
Emmanuel Mechalas, c/o Modern Machine Shop, Inc. 124 N. Hazel St., Danville, Ill. 61832

Continuation-in-part of Ser. No. 798,878, May 20, 1977, abandoned. This application Aug. 1, 1978, Ser. No. 930,047
Int. Cl.² B01D *33/10*
U.S. Cl. 210—77 **1 Claim**

1. A method for separating solids from a mixture of solids and liquid comprising the steps of:
providing a drum shaped member having imperforate end walls and a cylindrical peripheral surface that is pervious to the liquid in the mixture and impervious to the solids in the mixture,
revolving the drum shaped member about a horizontally disposed axis at a substantially constant rotational velocity;
discharging the mixture against the cylindrical surface of the drum shaped member from within the member at a high velocity such that all the liquid in the mixture immediately passes through said cylindrical surface and the solids

strike and adhere to the circumferential surface of the member and revolve therewith;

dislodging the solids from the circumferential surface of the member by application of a uniform jet of air thereto, into a hopper within the drum shaped member at a position above the level of the horizontal axis of the drum shaped member and conveying the dislodged solids through one



of said imperforate walls to a discharge point outside the drum shaped member; and

receiving the liquid passing through the circumferential surface of the drum shaped member at a level below the circumferential surface and draining said liquid away at a rate sufficient to prevent said level from contacting said circumferential surface.

4,200,531

TUBULAR MEMBRANE SEPARATION APPARATUS

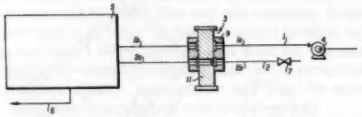
Chota Yanagi, Kobe, Japan, assignor to Kobe Steel, Limited, Kobe, Japan

Filed May 16, 1978, Ser. No. 906,422

Claims priority, application Japan, May 16, 1977, 52-56836

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—137 **5 Claims**



1. A tubular membrane separation apparatus which comprises:

a feedwater line;

tubular membrane means adapted to concentrate a feedwater communicating with said feedwater line;

a concentrated-water line which is disposed in such a manner that the direction of flow therein is opposite to the direction of flow in said feedwater line and which is communicated with said tubular membrane means downstream thereof; and

cleaning ball delivery means,

said cleaning ball delivery means including:

a stationary member disposed to cross said feedwater line and concentrated-water line and divide each of the two lines into an upstream and downstream segment;

said stationary member being provided with passageways extending in parallel with each other and respectively adapted to communicate said upstream segment of feedwater line with said downstream segment thereof and said upstream segment of concentrated-water line with said downstream segment thereof;

a movable member which comprises at least one ball retaining member including a chamber formed in communicable relationship with an upstream and a downstream segment of each of said passageways and a screen disposed adjacent one end of said chamber, said movable member being movably mounted within said stationary member in such a manner that said ball retaining member may be alternately shifted into phase with said two passageways; and

seal means adapted and disposed to establish a fluid-tight seal between cooperating surfaces of said stationary member and said movable member.

4,200,532

WASTEWATER TREATMENT APPARATUS

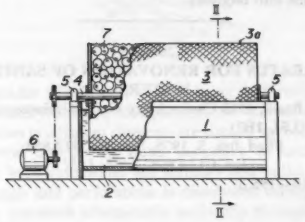
Akitoshi Iwatani, Marugame, and Masataro Takuma, Kagawa, both of Japan, assignors to Ishigaki Kiko Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1979, Ser. No. 2,979

Claims priority, application Japan, Jul. 22, 1978, 53/89598; Jun. 7, 1978, 53/78352[U]

Int. Cl.[2] B01D *33/10*

U.S. Cl. 210—151 **9 Claims**



1. An apparatus for wastewater treatment comprising a wastewater tank, a water pervious drum rotatable horizontally fixed mounted in the tank and submerged about one-half of its diameter in waste water in the tank and a multiplicity of biological contactors packed in the drum, said drum, at least its peripheral wall portion, being constructed of porous plate or woven metal wire so as to be water pervious, said biological contactors being of thin-walled hollow structure, formed of synthetic resins, each with only two small openings disposed at an angle of about 90° from the center of the hollow structure, and said plurality being sufficient and said contactors being sufficiently packed so as to prevent movement of said contactors within the drum.

4,200,533

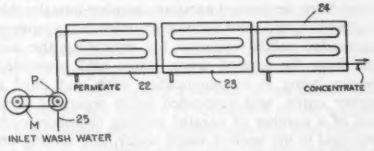
HYPERFILTRATION APPARATUS AND METHOD OF FLUID TREATMENT

Joseph L. Gaddis, 112 Brookwood La.; Craig A. Brandon, 103 Crestwood Dr., and Donald K. Todd, Booker Springs Rd., all of Clemson, S.C. 29631

Filed Jun. 28, 1978, Ser. No. 919,935

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—195.2 **2 Claims**



1. A tubular hyperfiltration apparatus for increasing the concentration of an effluent in a fluid treatment process comprising:

a plurality of joined porous stainless steel pipe sections fabricated so as to be joined together in end-to-end relation in series forming a continuous membrane support;

said pipe sections being joined by means including welding adjacent ends thereof;

a membrane deposited upon said stainless steel pipe dynamically formed from a membrane forming liquid in situ after fabrication;

means introduding effluent at an inlet portion of said stainless steel pipe under pressure;

said porous stainless steel pipe having sufficient strength to support its entire length under pressure making possible a single pass construction;

means segmenting a plurality of said pipe sections into modules; and

means joining said modules in series forming said continuous membrane support;

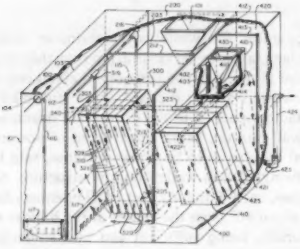
whereby an extremely long single pass configuration for treating industrial effluent is made possible by thus utilizing porous stainless steel membrane supports which are fabricated in single pass configuration utilizing membrane deposited in situ upon the support after joining of the sections into modules.

4,200,534

APPARATUS FOR RENOVATION OF SANITARY WATERS

Ferdinand Besik, 3243 Chokecherry Crs., Mississauga, Ontario, Canada (L5L 1B1)

Filed Jun. 5, 1978, Ser. No. 912,888
Int. Cl.[2] C02C *1/08, 1/12*
U.S. Cl. 210—195.3 **4 Claims**



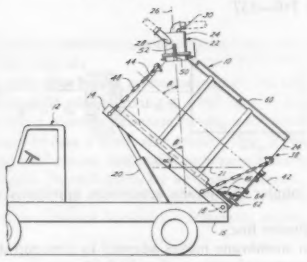
1. A self contained apparatus for treatment of waste waters comprising a waste water receiving tank, said waste water receiving tank including first, second and third aeration chambers, said aeration chambers being formed by the tank walls and common partitions between the first, second and third aeration chambers, said first, second and third aeration chambers being equipped with air diffusers to aerate and to agitate the contents thereof, said first aeration chamber including an inlet and said third aeration chamber including an outlet, said aeration chambers being in communication through restricted openings in common partitions for flowing the waste water from the first aeration chamber into the second aeration chamber and from the second aeration chamber into the third aeration chamber, said third aeration chamber being equipped with a suspended solids separator for separating the suspended solids from the aerated waste water, said suspended solids separator being in communication with said third aeration chamber outlet, said suspended solids separator being composed of a number of parallel settling chambers completely submerged in the aerated waste water, said settling chambers each having openings in the side walls at the bottom of said settling chambers and restricted openings at the top for flowing the treated waste water from said third aeration chamber through said side wall openings into said settling chambers then upwardly through said settling chambers and out through said restricted openings into a collection channel, said collection channel being in communication with said third aeration chamber outlet, said third aeration chamber being also equipped with a channel located in said common partition between the first and third aeration chambers for flowing a portion of the aerated waste water and the separated suspended solids from said third aeration chamber into said first aeration chamber to distribute said suspended solids evenly through each aeration chamber, said third aeration chamber outlet being in communication with a flow equalizer for controling the flow rate of the treated waste water in said settling chambers and out of said third aeration chamber, said waste water receiving tank comprising in addition a chemical agent dissolving chamber and a chemical oxidation chamber, said chemical agent dissolving chamber for dissolving the chemical agent into the treated waste water in proportion to the flow of the waste water, said chemical agent dissolving chamber being in communication with said flow equalizer and receiving the effluent therefrom, said chemical agent dissolving chamber having a vertical slit opening in one side wall causing to rise the level of the liquid therein in proportion to the flow of the treated waste therefrom and said chemical agent dissolving chamber in addition being equipped with a container for storing and dissolving the chemical agent into the treated waste water and the treated waste water flowing by gravity from said flow equalizer into said chemical agent dissolving chamber and through said slit opening out of said chemical agent dissolving chamber into said chemical oxidation chamber for chemical oxidation of impurities remaining in the treated waste water, and said chemical oxidation chamber having an outlet for flowing the chemically treated waste water out of the apparatus.

4,200,535

APPARATUS FOR TRANSPORTING MATERIAL SEPARATED FROM A FLOWING FLUID

Alvin B. Kennedy, Jr., P.O. Box 897, Alvin, Tex. 77511

Filed Aug. 22, 1977, Ser. No. 826,475
Int. Cl.[2] B01D *35/14*
U.S. Cl. 210—241 **2 Claims**



1. A portable device used in separating material from a flowing fluid and supporting the separated material during transportation to another location, comprising:

(a) a cyclone separator for separating material from the flowing fluid, said cyclone separator having

(i) a body positioned around an operating axis,

(ii) an inlet passageway located in an outside wall of the body to carry material and fluid into the body and around the operating axis,

(iii) a fluid outlet passageway located in the body to carry the fluid from the body, and

(iv) a separated material outlet passageway located in the bottom of the body, to carry the separated material from the body; and

(b) an elongated container mounted with said cyclone separator for receiving the material being separated and supporting the separated material during transportation from one location to another, said container having

(i) a first end, including a door mounted therewith where the container is pivoted around a pivotal axis, the piv-

otal axis lying in a horizontal plane and extending transversely to the elongate axis,

(ii) a second end having said cyclone separator mounted thereon, said separator being mounted on said container so that pivotal movement of the container about the transverse pivotal axis from a horizontal transporting position to a separating position moves the operating axis of said separator into a substantially vertical position for separating the material, the second end being raised higher than the first end when moved to the separating position which causes the separated material to drop toward the first end while the material is being separated as an aid in filling said container, the container being returned about the transverse axis to the horizontal position for transporting the separated material to another location; said container being mounted with the operating axis forming an angle relative to the horizontal plane when said container is in transporting position, the sum of this angle and the angle formed between the transporting position and separating position being substantially 90°;

(c) fullness indicating means mounted with said container for indicating when said container is ready for transporting, said means comrprising:

(i) a feeler flap attached to a rod rotatably disposed between said container and said cyclone separator, and

(ii) a handle mounted with the rod for controlling the movement of said feeler flap to indicate when said container is full by contact between the flap and separated material;

(d) position indicating means mounted with said container for indicating when said container is in the separating position for operating said cyclone separator, said means comprising:

(i) a lever arm extending from said container at an angle substantially parallel to the operational axis of said cyclone separator, and

(ii) an indicating arm mounted on said lever arm in free pivotal movement for indicating the operating position of said cyclone separator when lying substantially parallel to said lever arm;

(e) a remotely controlled door opening means mounted between said first end door and said container to open said door from a distance to thereby inhibit possible injury to air individual when opening said door for unloading the separated material therefrom, said means comprising:

(i) a plate slidably mounted on said door for movement into a slot provided on said container and

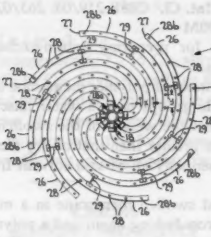
(ii) a control arm pivotally mounted with said door, said control arm having a first end pivotally mounted with said plate and a second end for attaching a line thereto which permits the opening of said door from a distance.

4,200,536
UNDERDRAIN FOR FILTER TANKS

Samuel Kaufman, 860 Pennsylvania Ave., Hagerstown, Md. 21740

Filed Aug. 22, 1978, Ser. No. 935,859
Int. Cl.² B01D *23/20*
U.S. Cl. 210—279 **2 Claims**

1. In a filter system having an underdrain assembly facilitating a backwashing operation, a tank having a cylindrical side wall and a substantially horizontal bottom wall, a bed of filtering material contained in said tank, said assembly being located within said tank near said bottom wall, said assembly comprising a central hub having spaced upper and lower walls defining a chamber therebetween, an outlet sleeve in open communication with said chamber through said lower wall and extending outwardly of said bottom wall, a plurality of radially extending sleeves in open communication with said chamber from between said upper and lower walls, a plurality of elongated and hollow tubular elements connected to said radially extending sleeves and in open communication with said chamber, said elements having capped terminal ends and lying parallel to said bottom wall, said tubular elements being spirally shaped between opposite ends thereof and lying parallel to one another and equally spaced apart between said opposite ends, said elements being of substantially equal length and said terminal ends lying closely adjacent said cylindrical side wall, and said elements having perforations of equal size in lower sides thereof, a first of said perforations of each said elements being spaced first equal distances from inner ends of said elements,

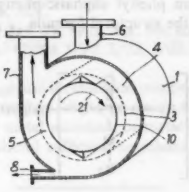


the remainder of said perforations being uniformly spaced in said elements from said first perforations thereof so that said perforations in adjacent elements are equally spaced apart from said central hub to the outer periphery of said assembly, whereby backwash water fed through said outlet sleeve and out through said perforations is distributed during the backwashing operation substantially uniformly through said filter bed so that the entirety of the filter bed is completely and uniformly backwashed.

4,200,537
APPARATUS FOR THE PURIFICATION OF PAPER PULP

Jean P. J. Lamort, Saint Limier en Champagne, France, assignor to E. et M. Lamort, Vitry Le Francois, France

Filed Nov. 6, 1978, Ser. No. 957,928
Claims priority, application France, Nov. 23, 1977, 77 35151
Int. Cl.² B01D *29/38*; B07B *1/20*
U.S. Cl. 210—415 **24 Claims**



1. An apparatus for purifying paper pulp by screening in the liquid state, said apparatus comprising a tank containing at least one fixed screen defining a first and a second chamber, the surface of said screen being a surface of revolution about an axis, said axis being the rotational axis of a rotor disposed inside the screen, said rotor having a surface of revolution substantially parallel to said surface of revolution of the screen, and having longitudinal blades disposed thereon, said blades having, in a section transverse to the axis, the general shape of an angle, one face of the blades being directed approximately radially towards the axis and the other face being inclined thereto, and first nozzle means for placing the tank in communication with a crude pulp inlet source or an outlet for purified pulp, said first nozzle means merging the crude pulp into the tank in a direction generally tangential to the direction of rotation of the rotor.

4,200,538
PROCESS FOR PREPARING CATION-EXCHANGE MEMBRANE

Toru Seita; Kenji Takahashi; Shunichi Asami, and Akihiko Shimizu, all of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co. Ltd., Yamaguchi, Japan

Filed Jun. 17, 1977, Ser. No. 807,638
Claims priority, application Japan, Jul. 2, 1976, 51-77908
The portion of the term of this patent subsequent to Jan. 2, 1996, has been disclaimed.
Int. Cl.[2] C08F *259/08, 265/02*
U.S. Cl. 210—500M **10 Claims**

1. A process for preparing cation-exchange membranes which comprises:

swelling a fluorinated polymer membrane containing cation exchangeable groups with a water miscible organic solvent such that the weight of the swollen membrane is at least 3 wt.% greater than that of dry membranes;

vaporizing essentially all of said solvent from said swollen membrane;

immersing said swollen membrane in a monomer with or without a cross-linking agent and a polymerization initiator for from about 5 minutes to about 50 hours at −20° to about 100° C.; and

polymerizing the monomer.

10. The membrane prepared by the process of claim 1.

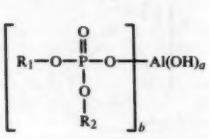
4,200,539
FRACTURING COMPOSITIONS AND METHOD OF PREPARING AND USING THE SAME

John W. Burnham, Duncan, Okla., and Robert L. Tiner, Brownfield, Tex., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 20, 1978, Ser. No. 898,055
Int. Cl.[2] E21B *43/26*
U.S. Cl. 252—8.55 R **5 Claims**

1. The method of fracturing a subterranean formation which comprises:

admixing with an oil base fluid, from about 0.25 weight percent to about 6.0 weight percent of at least one compound selected from the group of aluminum salts consisting of aluminum phenyl phosphates, aluminum aliphatic-phenyl phosphates, aluminum phenyl aliphatic phosphates, aluminum aliphatic-phenyl aliphatic phosphates and aluminum phenyl aliphatic-phenyl phosphates, said salts having the structural formula



where

a=0 to 2,

b=1 to 3,

and the sum of a+b=3;

R_1=a phenyl or aliphatic hydrocarbon-phenyl group containing from 6 to 26 carbon atoms, and

R_2=a phenyl, aliphatic hydrocarbon-phenyl or aliphatic hydrocarbon group containing from 1 to 26 carbon atoms, or H;

provided, however, that where R_1 is a phenyl group, then R_2 must be either an aliphatic hydrocarbon group containing at least 6 carbon atoms, or an aliphatic hydrocarbon-phenyl group containing at least 12 carbon atoms; and provided that if R_2 is a phenyl group, then R_1 is an aliphatic hydrocarbon-phenyl group containing at least 12 carbon atoms; and provided that if both R_1 and R_2 are aliphatic hydrocarbon-phenyl groups, one of R_1 or R_2 contains at least 12 carbon atoms; and provided that where R_1 is an aliphatic hydrocarbon-phenyl containing less than 12 carbon atoms and R_2 is aliphatic hydrocarbon, R_2 must contain at least 6 carbon atoms; then

pumping the mixture via a borehole into a formation adjacent the borehole at a formation fracturing pressure to fracture the formation.

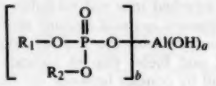
4,200,540
METHOD FOR FRACTURING SUBTERRANEAN FORMATIONS

John W. Burnham, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 20, 1978, Ser. No. 898,059
Int. Cl.[2] E21B *43/26*
U.S. Cl. 252—8.55 R **6 Claims**

1. A method for fracturing a subterranean formation at a location where the temperature exceeds about 150° F. comprising:

adding at a temperature of less than about 150° F. to a hydrocarbon liquid, a phosphoric acid ester and a basic aluminum compound to form, in situ, at least one aluminum salt selected from the group having the structural formulae:



(1)

where

a=0 to 2,

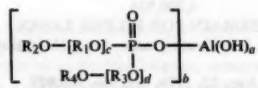
b=1 to 3,

and the sum of a+b=3;

R_1=a phenyl or aliphatic hydrocarbon substituted-phenyl group containing from 6 to 24 carbon atoms; and

R_2=a phenyl, aliphatic hydrocarbon substituted-phenyl or aliphatichydrocarbon group containing from 1 to 24 carbon atoms, or H; provided, however, that where R_1 is a phenyl group, then R_2 must be either an aliphatic hydrocarbon group containing at least 6 carbon atoms, or an aliphatic hydrocarbon substituted-phenyl group containing at least 12 carbon atoms; and provided that if R_2 is a phenyl group, then R_1 is an aliphatic hydrocarbon substituted-phenyl group containing at least 12 carbon atoms; and provided that if both R_1 and R_2 are aliphatic hydrocarbon substituted-phenyl groups, one of R_1 or R_2 contains at least 12 carbon atoms; and provided that where R_1 is an aliphatic hydrocarbon substituted-phenyl containing less than 12 carbon atoms and R_2 is aliphatic hydrocarbon, R_2 must contain at least 6 carbon atoms;

and



(2)

where

a=0 to 2,

b=1 to 3,

c=1 to 5,

d=1 to 5,

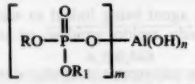
and the sum of a+b=3;

R_1O and R_3O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, or $CH_2CH(CH_3)O$, or CH_2CH_2O, and

R_2O and R_4O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, and wherein

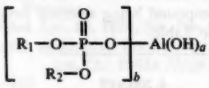
R_1O and R_2O may differ from each other but shall together contain from 1 to 24 carbon atoms, and R_3O and R_4O may differ from each other but shall together contain from 1 to 20 carbon atoms, provided that at least one of R_1O and

R_3O shall be either $CH_2CH(CH_3)O$ or CH_2CH_2O, and provided further that where either R_1O or R_3O is neither $CH_2CH(CH_3)O$ nor CH_2CH_2O, then the respective R_2O or R_4O group otherwise bonded thereto shall be deleted; and



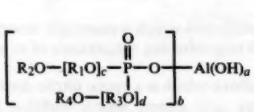
(3)

where
m=1 to 3,
n=0 to 2,
and the sum of n+m=3; and
R and R_1 are independently C_1 to C_{20} alkyls, or C_2 to C_{20} alkenyls, or C_2 to C_{20} alkynyls, or R or R_1, but not both, may be H; provided, however, that where either R or R_1 contains fewer than 6 carbon atoms, then the other of R or R_1 contains at least 7 carbon atoms;
aging the salt-containing hydrocarbon for a period of from about 3 minutes to about 20 hours to form a pumpable gel;
adding to said gel, at a temperature below about 150° F., at least one aluminum salt insoluble in said gel at the temperature of the addition in solid particulate form to form a dispersion of said solid salt and said gel, said added solid aluminum salt being selected from the group of compounds having the strutural formulae:



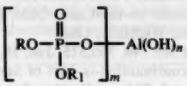
(4)

where
a=0 to 2,
b=1 to 3,
and the sum of a+b=3;
R_1=a phenyl or aliphatic hydrocarbon substituted-phenyl group containing from 6 to 24 carbon atoms, and
R_2=a phenyl, aliphatic hydrocarbon substituted-phenyl or aliphatic group containing from 1 to 24 carbon atoms, or H;
and



(5)

where
a=0 to 2,
b=1 to 3,
c=1 to 5,
d=1 to 5,
and the sum of a+b=3;
R_1O and R_3O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, or $CH_2CH(CH_3)O$, or CH_2CH_2O, and
R_2O and R_4O=an alkyloxy, alkenyloxy or alkynyloxy group containing from 1 to 18 carbon atoms, with either R_2 or R_4 containing at least 14 carbon atoms; and wherein
R_1O and R_2O may differ from each other but shall together contain from 1 to 24 carbon atoms, and R_3O and R_4O may differ from each other but shall together contain from 1 to 20 carbon atoms, provided that at least one of R_1O and R_3O shall be either $CH_2CH(CH_3)O$ or CH_2CH_2O, and provided further that where either R_1O or R_3O is neither $CH_2CH(CH_3)O$ nor CH_2CH_2O, then the respective R_2O or R_4O group otherwise bonded thereto shall be deleted; and



(6)

where
m=1 to 3,
n=0 to 2,
and the sum of n+m=3; and
R and R_2 are independently C_1 to C_{20} alkyls, or C_2 to C_{20} alkenyls, or C_2 to C_{20} alkynyls, or R or R_1, but not both, may be H; and provided that at least one of R and R_1 shall contain at least 14 carbon atoms; then
introducing said mixture into the formation to be fractured under pressure sufficient to accomplish fracturing.

4,200,541

BEARING MATERIALS

George H. Kinner, Fleet, and John K. Lancaster, Reading, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 2, 1977, Ser. No. 857,025
Claims priority, application United Kingdom, Dec. 6, 1976, 50675/76
Int. Cl.[2] C10M *7/28, 7/06, 7/02*
U.S. Cl. 252—12.2 **21 Claims**

1. A material suitable for use in a dry bearing or as a lining in a dry bearing which comprises a matrix of metal having a multiplicity of closely spaced, small blind holes introduced at selected uniformly spaced sites in its bearing surface, said holes being confined essentially to said bearing surface and said matrix being otherwise non-porous, the said holes being filled with a solid lubricant, said holes having an average diameter less than 1 mm and an average center-to-center spacing less than 1 mm.

4,200,542

GREASE COMPOSITION

Michael Sedlak, Woodbury, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 24, 1979, Ser. No. 6,064
Int. Cl.[2] C10M *5/20, 5/12, 5/02, 7/32*
U.S. Cl. 252—25 **11 Claims**

1. A lubricating grease formulation comprising a lubricating vehicle, thickener, sodium nitrite, an amine and an amount of a combination of (1) metal ascorbate or metal isoascorbate with (2) an alpha tocopherol sufficient to inhibit the formation of N-nitrosamines.

4,200,543

SYNERGISTIC ANTIOXIDANT LUBRICATING OIL ADDITIVE COMPOSITION

Thomas V. Liston, San Rafael, and Warren Lowe, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 26, 1978, Ser. No. 973,067
Int. Cl.[2] C10M *1/48, 1/42, 1/38, 3/42*
U.S. Cl. 252—32.7 E **11 Claims**

1. An internal combustion engine lubricating oil additive composition comprising synergistic antioxidant proportions of:
(1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized ester-olefins, and
(2) an oil-soluble chlorinated hydrocarbon containing at least 6 carbon atoms.

2. The composition of claim 1 which also contains a minor effective amount of zinc dihydrocarbyldithiophosphate.

4,200,544

MAGNESIUM-CONTAINING GREASES AND METHOD FOR THEIR PREPARATION

John W. Forsberg, Mentor-on-the-Lake, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 760,315, Jan. 18, 1977, Pat. No. 4,094,801, which is a continuation-in-part of Ser. No. 681,627, Apr. 29, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,718

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.[2] C10M *5/22, 5/16, 7/38, 7/22*

U.S. Cl. 252—33.2 13 Claims

1. A method for preparing a non-carbonated magnesium-containing grease which comprises heating, at a temperature above about 30° C., a mixture comprising:

(A) at least one of magnesium hydroxide, magnesium oxide, hydrated magnesium oxide, or a magnesium alkoxide;

(B) an oleophilic organic reagent comprising at least one carboxylic acid, a mixture thereof with at least one sulfonic acid, or an ester or alkali metal or alkaline earth metal salt of the same;

(C) water; and

(D) at least one relatively non-volatile, substantially inert, normally liquid solubilizing agent for component B;

the ratio of equivalents of magnesium to component B, calculated as the free acid, being at least about 5:1, and the amount of water present being at least sufficient to hydrate a substantial proportion of component A calculated as magnesium oxide.

4,200,545

AMINO PHENOL-DETERGENT/DISPERSANT COMBINATIONS AND FUELS AND LUBRICANTS CONTAINING SAME

Donald L. Clason, Mentor; John F. Pindar, Euclid, and Jerome M. Cohen, University Heights, all of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 653,177, Jan. 28, 1976, Pat. No. 4,100,082, which is a continuation-in-part of Ser. No. 701,938, Jul. 2, 1976. This application Jul. 3, 1978, Ser. No. 921,624

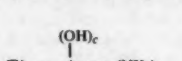
The portion of the term of this patent subsequent to Jul. 11, 1995, has been disclaimed.

Int. Cl.[2] C10M *1/40, 1/36, 1/32, 3/34*

U.S. Cl. 252—33.4 71 Claims

1. A nitrogen-containing organic composition comprising a combination of:

(A) at least one amino phenol of the general formula



wherein R is a substantially saturated, hydrocarbon-based substituent of at least 10 aliphatic carbon atoms; a, b and c are each independently an integer of one up to three times the number of aromatic nuclei present in Ar with the proviso that the sum of a, b and c does not exceed the unsaturated valences of Ar; and Ar is an aromatic moiety having 0–3 optional substituents selected from the group consisting of lower alkyl, lower alkoxyl, nitro, halo or combinations of two or more of said substituents; and

(B) at least one detergent/dispersant selected from the group consisting of

(I) at least one neutral or basic metal salt of an organic sulfur acid, phenol or carboxylic acid;

(II) at least one hydrocarbyl-substituted amine wherein the hydrocarbyl substituent is substantially aliphatic and contains at least 12 carbon atoms with the proviso that said amine is not the amino phenol (A);

(III) at least one acylated, nitrogen-containing compound having a substituent of at least 10 aliphatic carbon atoms made by reacting a carboxylic acylating agent with at least one amino compound containing at least one

group, said acylating agent being linked to said amino compound through an imido, amido, amidine, or acyloxy ammonium linkage; and

(IV) at least one nitrogen-containing condensate of a phenol, aldehyde and amino compound having at least one

group.

4,200,546

METAL SALT TREATED SULFURIZED OLEFINS AND ORGANIC COMPOSITIONS CONTAINING SAME

Andrew G. Horodysky, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 8, 1979, Ser. No. 1,552

Int. Cl.[2] C10M *1/54, 1/38, 3/32;* C07G *17/00*

U.S. Cl. 252—46.4 36 Claims

1. A metal salt reaction product of a sulfurized olefin prepared by reacting a sulfurized olefin with a metal compound, the metal of said compound being selected from Group IIA and B of the Periodic Table.

4,200,547

MATRIX-BONDED PERMANENT MAGNET HAVING HIGHLY ALIGNED MAGNETIC PARTICLES

Edward D. Beck, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 2, 1979, Ser. No. 70

Int. Cl.[2] H01F *1/117, 7/02*

U.S. Cl. 252—62.54 7 Claims

1. Matrix-bonded permanent magnet comprising magnetically-hard, anisotropic particles in a nonmagnetic binder, which particles comprise at least 60 volume percent of the magnet and have an alignment exceeding 90%, said binder consisting essentially of

hot-melt polyamide resin which is essentially amorphous and has a ball-and-ring softening temperature of at least 50° C. and

a processing additive which is a cyclic nitrile derivative of a saturated fatty acid dimer, which additive comprises 1–35% by weight of the total binder.

4,200,548

SILICIC ACID DETERGENT PRODUCT FOR MICRODEPOSITION OF SILICIC ACID ON TEXTILES

Olof Sundén, Lidingö; Hans Johansson, Kungälv; Håkan B. Ahlberg, Surte, and Per-Arne I. Kårlsson, Kallered, all of Sweden, assignors to Elektrokemiska Aktiebolaget, Surte, Sweden

Continuation-in-part of Ser. No. 819,509, Jul. 26, 1977, abandoned. This application Mar. 8, 1978, Ser. No. 884,391

Claims priority, application Sweden, Aug. 2, 1976, 7608659; Aug. 2, 1976, 7608660

Int. Cl.[2] C11D *3/37, 3/20*

U.S. Cl. 252—135 13 Claims

1. A silicic acid product to be used for laundry purposes and having the property of depositing microamounts of silicic acid on cellulose and polyester fibers of launderable textiles to thereby prevent redeposition of soil from the laundry medium onto the textile materials, said silicic acid product comprising

an adduct of polymer silicic acid with a polyethylene oxide compound selected from the group consisting of polyethylene glycols and nonionic ethylene oxide tensides together with alkali of the formula M_2O, where M is selected from the group consisting of Na, K, Li and alkanolamines, wherein the molar ratio $SiO_2:M_2O$ is 4–100, said product being physically or colloidally soluble in laundry medium within a pH range of 8–12.

4,200,549

α-CYANOACRYLATE-BASE ADHESIVE COMPOSITIONS

Kenichiro Okamura, Kyoto, and Yasuo Nakamuru, Hikone, both of Japan, assignors to Alpha Techno Company, Osaka, Japan

Filed May 23, 1978, Ser. No. 908,865

Claims priority, application Japan, Jul. 7, 1977, 52-81745

Int. Cl.[2] C09J 3/00; C07C 121/32, 121/417

U.S. Cl. 252—182 **5 Claims**

1. An α-cyanoacrylate-base adhesive composition comprising 100 parts by weight of at least one α-cyanoacrylate monomer and 5 to 300 parts by weight of trichlorotrifluoroethane.

4,200,550

PROCESS AND APPARATUS FOR DESALTING CRUDE PETROLEUM

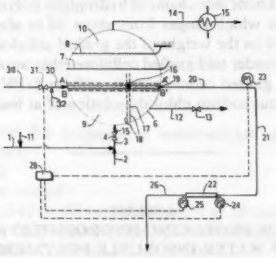
Claude Scherrer; Claude Baumann, both of Le Havre; Herbert Wiegandt, Paris, all of France; John-Russel Richmond, High Beach, England; Bernard Siffert, Illfurth, and Claudine Bourgeois, Mulhouse, both of France, assignors to Compagnie Francaise de Raffinage and Universal Matthey Products S.A., both of Paris, France

Filed Apr. 19, 1978, Ser. No. 898,426

Claims priority, application France, Apr. 20, 1977, 77 11906

Int. Cl.[2] B01D 17/04

U.S. Cl. 252—335 **9 Claims**



1. A process for desalting crude petroleum, said process comprising the following sequential steps:

(A) continuously introducing into a desalter an unstable aqueous emulsion of crude petroleum,

(B) resolving said unstable emulsion in said desalter into a water phase and a crude phase, said resolving step being capable of resulting in the formation of an intermediate phase composed of a stable emulsion located between said water phase and said crude phase, and

(C) continuously drawing off the water phase and crude phase from said desalter,

wherein the improvement comprises the following combination of additional steps:

(a) continuously adjusting the level of the top surface of said water phase alternately between predetermined upper and lower limiting levels whereby at a predetermined level situated between said upper and lower limiting levels there are arranged successively said water phase, said intermediate phase of stable emulsion when formed, and said crude phase;

(b) taking a sample at said predetermined level;

(c) testing whether said sample contains a predetermined minimum quantity of said stable emulsion, and

(d) if said sample contains said minimum quantity of said stable emulsion, injecting a second demulsifying agent into said desalter at said predetermined level.

4,200,551

COLD-WATER-DISPERSIBLE LECITHIN CONCENTRATES

Frank T. Orthoefer, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.

Filed Nov. 27, 1978, Ser. No. 964,102

Int. Cl.[2] B01J 13/00; B01F 17/30

U.S. Cl. 252—312 **18 Claims**

1. A lecithin concentrate adapted to readily disperse into water at 10° C. and 10% by weight concentration and form a stable emulsion therewith, said concentrate comprising lecithin characterized as having an I.V. of at least 75 and at least one nonionic emulsifier having an HLB of at least 12 and selected from the group consisting of polyoxyalkylene monoglyceride, polyoxyalkylene diglyceride and the polyoxyethylene derivatives of partial fatty acid esters and hexitol anhydride, with said emulsifier being homogeneously dispersed throughout said concentrate at a level ranging from about 5 to about 15 parts by weight nonionic emulsifier for each 100 parts by weight lecithin.

4,200,552

CATALYST CARRIER, CATALYST AND THEIR MANUFACTURING PROCESS

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki; Noboru Yamamoto, and Shigeo Soejima, both of Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and NGK Insulators, Ltd., Nagoya, both of, Japan

Continuation of Ser. No. 837,920, Sep. 29, 1977, abandoned. This application Jan. 11, 1979, Ser. No. 2,770

Claims priority, application Japan, Oct. 6, 1976, 51-120196

Int. Cl.[2] B01J 21/04, 21/12, 23/40

U.S. Cl. 252—466 PT **12 Claims**

1. Catalyst carrier comprising a porous refractory material having the internal surface of its pores deposited with an active alumina, in which said deposited carrier has a total pore volume of 0.05 –0.50 cc/g, an average pore diameter of 0.05 –5.0μ and a specific surface area of 3–60 m^2/g.

4,200,553

PROCESS FOR PRODUCING CYCLOHEXANONE

Jan F. Van Peppen, and William B. Fisher, both of Chester, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 827,189, Aug. 23, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,551

Int. Cl.[2] B01J 21/18, 23/58; C07C 45/00

U.S. Cl. 252—447 **2 Claims**

2. A modified catalyst for selective hydrogenation of phenol to cyclohexanone which consists of: (a) a sodium promoted palladium catalyst containing 0.2 to 10 weight percent of palladium and at least 1000 ppm sodium, based on the total weight of said catalyst, said catalyst being supported on carbon particles having a surface area of 100 to 2,000 m^2/gram, wherein substantially all of said particles have diameters of 5 to 300 microns; and (b) 0.1 to 10 parts by weight per part of said sodium promoted palladium catalyst, of fine carbon particles having diameters less than 5 microns and a surface area of 200 to 5000 m^2/gram, said particles being conventional porous carbonaceous material having vegetable or animal origin.

4,200,554
BARIUM- AND RUTHENIUM-CONTAINING PEROVSKITE CATALYSTS

Alan Lauder, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Continuation-in-part of Ser. No. 686,640, May 14, 1976, Pat. No. 4,110,258, which is a continuation of Ser. No. 463,986, Apr. 25, 1974, abandoned. This application Aug. 25, 1978, Ser. No. 936,744

Int. Cl.[2] B01J *21/06, 23/58, 23/64*

U.S. Cl. 252—474 10 Claims

1. A catalytic composition having the perovskite-type, ABO_3, crystal structure wherein the Type A cation sites are substantially fully occupied by ions of barium; the Type B cation sites are occupied by ions of at least two platinum group metals selected from ruthenium and at least one of osmium, rhodium, iridium, palladium and platinum, wherein ruthenium occupies up to about 10% of the Type B cation sites, with the total platinum group metal ions occupying about 1% to 20% of the Type B cation sites; the remainder of the Type B cation sites are occupied by ions of at least one nonplatinum group metal having an ionic radius between 0.4 to 1.4 Angstroms.

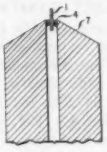
4,200,555
LOW WORK FUNCTION HEXABORIDE ELECTRON SOURCE

David C. Joy, Warren, and Paul H. Schmidt, Chatham, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 27, 1978, Ser. No. 928,528

Int. Cl.[2] H01B *1/06*

U.S. Cl. 252—521 7 Claims



1. An electron source comprising an electron emissive material and a mounting structure, said structure supporting said electron emissive material, characterized in that said electron emissive material consists of a composition represented by the nominal atom formula $(Z_x)(Nd_yPr_{1-y})_{1-x}B_6$; x less than 0.5 and greater than or equal to 0.2, y less than or equal to 1.0 and greater than or equal to 0.0, and Z selected from the group consisting of La and Ce.

4,200,556
REINFORCED RUBBER

Joseph G. Robinson, Winchcombe, and Lesley D. Herbert, Stroud, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed May 12, 1978, Ser. No. 905,376

Claims priority, application United Kingdom, May 27, 1977, 22462/77

Int. Cl.[2] C08L *7/00, 9/02, 9/06, 61/34*

U.S. Cl. 260—3 7 Claims

1. A method of making a reinforced rubber comprising cross-linking a blend of

(i) 100 parts of a rubber selected from the group consisting of styrene/butadiene rubber, nitrile rubber, natural rubber and a blend of at least two of them;

(ii) from 5 to 150 parts of a carbazole/phenol/formaldehyde resin made according to a procedure comprising the steps of:

(a) refluxing a mixture of carbazole, a monocyclic phenol and aqueous formaldehyde under alkaline conditions for from 3 to 15 minutes, the molar ratio of carbazole to phenol being from 1:2 to 1:5 and of carbazole + phenol to formaldehyde being from 2:1 to 1:1,

(b) bringing the mixture to a pH of from 1 to 2 by the addition of acid; and

(c) maintaining the acidified mixture at a pH from 1 to 2 and at a temperature of about 100° C. for from 1 to 5 hours;

(iii) from 1 to 5 parts of a vulcanising agent for the rubber; and

(iv) from 5 to 15 parts per hundred parts of the resin of a formaldehyde donor.

4,200,557
ABSORBENT PRODUCT INCLUDING GRAFTED INSOLUBILIZED CELLULOSE ETHER

Pronoy K. Chatterjee, Spotswood, and Robert F. Schwenker, Jr., Belle Mead, both of N.J., assignors to Personal Products Company, Milltown, N.J.

Division of Ser. No. 682,692, May 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 581,003, May 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 422,627, Dec. 7, 1973, Pat. No. 3,889,678. This application Oct. 17, 1977, Ser. No. 842,762

Int. Cl.[2] C08L *1/28*

U.S. Cl. 260—17 A 18 Claims

1. An improvement in an absorbent product for absorbing body fluids comprising water-insoluble, cellulose ether selected from the group consisting of carboxyalkyl cellulose, sulfoalkyl cellulose and phosphonoalkyl cellulose; said ether having a degree of substitution ranging from about 0.4 to about 1.3 average number of ether groups per anhydroglucose unit; the improvement comprising said ether having grafted onto its cellulose backbone side chains of hydrophilic polymer moieties in an amount which ranges from about 10 to about 90% by weight, based on the weight of the grafted cellulose ether and sufficient to render said grafted cellulose ether insoluble and to provide said grafted cellulose ether with an XOW in 1.5% by weight aqueous sodium chloride solution of at least 30.

4,200,558
METHOD OF PRODUCING HYDROPHILIC ARTICLES OF WATER-INSOLUBLE POLYMERS

Arno Holst; Michael Kostrzewa, and Helmut Lask, all of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Division of Ser. No. 838,339, Sep. 30, 1977, Continuation of Ser. No. 681,730, Apr. 29, 1976, abandoned, and a continuation-in-part of Ser. No. 535,972, Dec. 23, 1974, abandoned. This application May 8, 1978, Ser. No. 904,047

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1973, 2364628

Int. Cl.[2] C08L *1/10, 1/26;* B29D *7/02;* D01F *2/24*

U.S. Cl. 260—17 A 2 Claims

1. A process for the production of a hydrophilic film, fiber or spongy product of a water-insoluble polymer selected from the group consisting of regenerated cellulose, cellulose ether, cellulose ester, and polyalkylene, and capable of forming fibers and films, which comprises uniformly distributing in a mass of said polymer, up to 50% by weight of the total weight of said product of pulverulent or granular amorphous particles of an originally water-soluble cellulose ether prepared from natural cellulose and rendered by chemical cross-linking more than 50% by weight water-insoluble while remaining water absorbent, and shaping the resulting mixture.

4,200,559
ANIONIC PAPER SURFACE SIZING AGENT

Karl Peterlein, Gladbeck; Felix Schulde, Wulfen; Klaus M. Diedrich, and Volker W. Kulisch, both of Gladbeck, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Herne, Fed. Rep. of Germany

Filed Jun. 16, 1978, Ser. No. 916,124

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727510

Int. Cl.[2] C08L *3/02*

U.S. Cl. 260—17.4 ST 5 Claims

1. In an aqueous anionic paper surface sizing composition which comprises a solution of an anionic starch strengthener and a resin, the improvement wherein said resin consists essentially of a statistical copolymer of dicyclopentadiene and maleic anhydride produced at temperatures of 60°–150° C. and wherein said copolymer has been solubilized by reaction with ammonia or with primary or secondary amines.

4,200,560
PROCESS FOR PREPARING WATER-SOLUBLE ALKYD RESINS

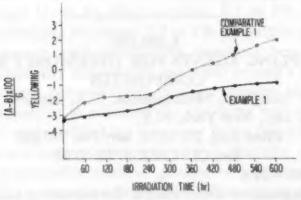
Masyoshi Kubo; Michio Nakanishi, and Shoji Watanabe, all of Ohi, Japan, assignors to Daicel Ltd., Saikai, Japan

Filed Apr. 12, 1978, Ser. No. 895,560

Claims priority, application Japan, Apr. 13, 1977, 52-42780; Apr. 13, 1977, 52 42781; Apr. 13, 1977, 52 42782; Sep. 16, 1977, 52 112032

Int. Cl.[2] C08L *67/08, 67/02;* C08G *63/22*

U.S. Cl. 260—22 EP 25 Claims



1. A process for preparing a water-soluble alkyd resin, which comprises

(1) reacting

(i) at least one of

(a) a 1,2-epoxyalkane containing 6 to 28 carbon atoms,

(b) a straight-chain internal epoxyalkane containing 6 to 20 carbon atoms,

(c) a mixture of one or more of the 1,2-epoxyalkane (a) and/or the internal epoxyalkane (b), or

(d) a mixture of one or more of the 1,2-epoxyalkane (a) and/or the internal epoxyalkane (b) and an unsaturated fatty acid containing 12 to 18 carbon atoms in a molar ratio of about 4:1 to about 2:1 of the 1,2-epoxyalkane (a) and/or the internal epoxyalkane (b) to the unsaturated fatty acid;

with

(ii) at least one of

a mixture of one or more aromatic carboxylic compounds selected from the group consisting of phthalic anhydride, isophthalic acid, terephthalic acid, an ester of isophthalic acid and an ester of terephthalic acid and an aliphatic dicarboxylic acid having 3 or more carbon atoms or an anhydride thereof

and

(iii) a polyhydric alcohol containing 2 to 10 carbon atoms, wherein said at least one of reactants (i)(a), (i)(b), (i)(c) or (i)(d) is added to a mixture of said reactants (ii) and (iii) while heating

to thus form a polyester containing hydroxyl groups and having an acid value of about 5 or less, a hydroxyl value of about 40 to about 200 and an average molecular weight of about 600 to about 2,500, said reacting resulting in dehydroesterification;

(2) reacting the hydroxyl groups of the polyester with an aromatic polycarboxylic acid anhydride to adjust the acid value of the polyester to about 25 to about 80 and form a carboxyl group-containing alkyd resin; and

(3) neutralizing the carboxyl group-containing alkyd resin with a base.

4,200,561
STABLE, COMPATIBLE THIXOTROPIC GEL WITH COPOLYMER GELLING AGENT

Irving B. Chang, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jul. 17, 1978, Ser. No. 925,252

Int. Cl.[2] C09G *1/10, 1/16;* C09K *3/20*

U.S. Cl. 260—23 H 35 Claims

1. A stable, compatible thixotropic gel composition having in the oil phase between about 5 and about 60 weight % gellant, between about 5 and about 50 weight % of a solvent incompatible at room temperature with the gellant and between about 20 and about 90 mole % of a cosolvent compatible with both the geilant and the solvent, at least 25 weight % of said gellant being a copolymer having between about 40 and about 96 mole % ethylene monomer and between about 4 and about 60 mole % of a comonomer selected from the group consisting of acrylic acid, methacrylic acid, ethacrylic acid, esterified acrylic acid, vinyl acetate, vinyl formate, vinyl propionate and mixtures thereof, said copolymer having a number average molecular weight between about 500 and about 10,000, said copolymer being present in a proportion great enough to maintain said gel composition stable from 10° to 50° C.

4,200,562
SIZING AGENT FOR USE IN MAKING PAPER

Shigehiko Yoshioka, Akashi, and Kaoru Okada, Kobe, both of Japan, assignors to Seiko Kagaku Kogyo Co., Ltd., Hyogo, Japan

Filed Mar. 21, 1978, Ser. No. 888,644

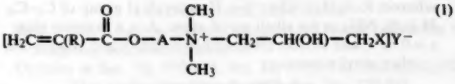
Claims priority, application Japan, Jun. 10, 1977, 52/69247

Int. Cl.[2] C08L *33/14*

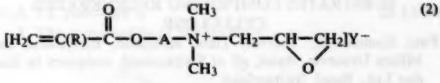
U.S. Cl. 260—29.6 RW 2 Claims

1. A method of producing a sizing agent for making paper comprising the steps of:

preparing a water-soluble cationic copolymer compound by reacting a first monomeric material containing a predominant amount of a compound of the formula



and a minor amount of a compound of the formula



the symbols in the two formula being defined as

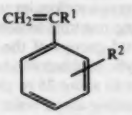
R is hydrogen or CH_3,

X is a halogen atom,

A is a (C_2–C_6) alkylene group,

Y is a halogen ion or an anion of acid salt such as phosphate, acid phosphate, sulfate, bisulfate, methyl sulfate, sulfonate, sulfamate, acetate, formate, oxalate, acrylate, or α-methacryloxyacetate,

with a second monomer of the formula



(3)

wherein

R^1 and R^2 are H or CH_3,

for about five hours at pH 6–5 and 80°–85° C.; and

dispersing in an aqueous emulsion dispersion of said copolymer compound a polymerizable hydrophobic monomer of said second monomer at a ratio of 1:1–1:4 (by weight) causing the resultant dispersion to react at pH 6 or less and 70°–80° C. for six hours by using a polymerization initiator to subject said dispersion to a radical emulsion polymerization.

4,200,563

METHOD OF PRODUCING AQUEOUS POLYMER EMULSION WITH IMPROVED STABILITY

Shigeo Komiya, Okayama, Japan, assignor to Japan Exlan Company Limited, Osaka, Japan

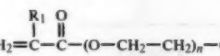
Filed Mar. 29, 1978, Ser. No. 892,408

Claims priority, application Japan, Apr. 12, 1977, 52-42204

Int. Cl.[2] C08L *33/14*

U.S. Cl. 260—29.6 SQ **4 Claims**

1. A method of producing an aqueous polymer emulsion with improved stability characterized in that, in producing an emulsifier-free aqueous polymer emulsion, a monomer mixture consisting of a polyoxyethylene-containing vinyl monomer (A) represented by the following general formula (I):

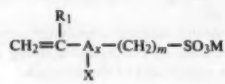


(I)

wherein R_1 is H or CH_3; R_2 is H, CH_3 or C_6H_4—$(CH_2)_m$—H;

n is an integer of from 4 to 30; and m is an integer of from 0 to 20,

which forms 0.01 to 30 weight % of the total monomer mixture; a vinyl monomer (B) represented by the following general formula (II):



(II)

wherein R_1 is H or CH_3; X is H or an alkyl group of C_1–C_4; M is H, NH_4 or an alkali metal atom; A is a benzene ring;

x is 0 or 1; and m is an integer of from 0 to 4 and at least one other vinyl monomer.

4,200,564

AQUEOUS PREPARATIONS FOR TREATING TEXTILE SUBSTRATES COMPRISING REGENERATED CELLULOSE

Paul Komminoth, Therwil; Tibor Robinson, Birsfelden, and Milica Urosevic, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 796,640, May 13, 1977, Pat. No. 4,125,652. This application Oct. 18, 1978, Ser. No. 952,359

Int. Cl.[2] D06M *13/14, 13/22, 13/38*

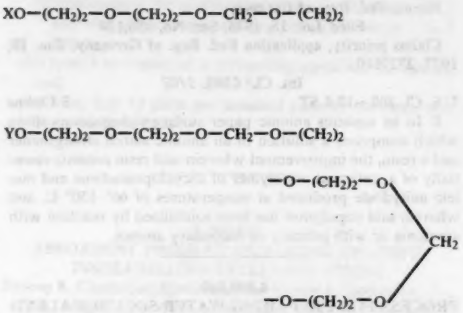
U.S. Cl. 260—29.4 R **4 Claims**

1. An aqueous preparation for treating textile substrates comprising or consisting of regenerated cellulose, which preparation comprises an effective amount of each of:

(A) a monomeric, hydrolysis stable, hydrosoluble, resin cross-linking agent containing at least two N-methylol or N-alkoxymethyl groups,

(B) a hydrosoluble, prepolymerized, linear, filler resin forming, cross-linking agent containing at least two N-methylol or N-alkoxymethyl groups,

(C) a reactive acetal of formula



wherein X and Y, independently, are hydrogen or CH_2OH,

(D) as a first cross-linking catalyst, an alkaline earth metal salt of a strong acid, and

(E) as a second cross-linking catalyst, an acidic aluminium salt,

said components A, B, C, D and E being present in a weight ratio of 10–80:5–40:10–80:2.5–20:0.5–4, based on the water-free weight of each component.

4,200,565

COUPLING AGENTS FOR THERMOSET RESIN COMPOSITES

Francis C. Naughton, Mountainside, N.J., assignor to N L Industries, Inc., New York, N.Y.

Filed Aug. 29, 1978, Ser. No. 937,831

Int. Cl.[2] C08K *5/10, 9/04*

U.S. Cl. 260—31.6 **15 Claims**

1. A composition comprising a thermosetting resin containing a particulate inorganic mineral filler and a coupling agent in the amount of from about 0.2 to 3% by weight of said filler, said coupling agent comprising a multifunctional hydroxyl bearing compound which has been at least partially acetylated.

4,200,566

THERMOPLASTIC POWDER COATING SYSTEMS

Emerson B. FitzGerald, Wilmington, Del., and Walter C. Meyer, Lake Orion, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 771,066, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 576,633, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 405,627, Oct. 11, 1973, abandoned. This application May 15, 1978, Ser. No. 905,969

Int. Cl.[2] C08L *67/00*

U.S. Cl. 260—37 N **7 Claims**

1. A thermoplastic powder coating composition comprising particles of polymeric material consisting essentially of a mixture of polymer (A) and polymer (B),

polymer (A) and polymer (B) being selected from the group consisting of polymer of an alkyd, polyester and polyester urethane,

one of either polymer (A) or polymer (B) containing an average of about 0.5–1.3 reactive groups per molecule and the other of polymer (A) or polymer (B) containing an average of 1–10 reactive groups per molecule

the reactive groups on polymer (A) being co-reactive in a condensation reaction

with the reactive groups on polymer (B); wherein said particles have an average diameter of about 5–300 microns;

wherein said polymer (A) and polymer (B) before said condensation reaction have a glass transition temperature of about 45–155° C., a weight average molecular weight of about 5,000–180,000; wherein said polymer (A) and polymer (B) are compatible as indicated by the miscibility of their solutions; wherein said reactive groups are selected from the class consisting essentially of acid chloride, isocyanato, amino, hydroxyl, epoxy, and aziridinyl groups, and wherein the product of said condensation reaction has a weight average molecular weight of about 40,000–200,000.

4,200,567

SYNERGISTIC IMPACT MODIFIER SYSTEM FOR POLY (ALKYLENE TEREPHTHALATES)

Theodore D. Goldman, Cornwells Heights, Pa., and Sutton B. Farham, Richmond, Va., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 22, 1977, Ser. No. 826,289

Int. Cl.[2] B01F *7/00;* **C08L** *67/06*

U.S. Cl. 260—40 R **18 Claims**

1. A synergistic impact modifier system for poly(C_2 to C_8 alkylene terephthalate) comprising

A. one or more thermoplastic segmented copolyester elastomers, and

B. one or more multiphase composite interpolymers comprising a final rigid thermoplastic phase polymerized in the presence of a first elastomeric phase polymerized from a monomer system selected from the group consisting of

i. a monomer system comprising about 75 to 99.8% by weight C_1 to C_8 alkyl acrylate, 0.1 to 5% by weight crosslinking monomer, 0.1 to 5% by weight graftlinking monomer, said crosslinking monomer being a polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups all of which polymerize at substantially the same rate of reaction, and said graftlinking monomer being polyethylenically unsaturated monomer having a plurality of addition polymerizable reactive groups, at least one of which polymerizes at a substantially different rate of polymerization from at least one other of said reactive groups; and

ii. a monomer system comprising at least 50 percent by weight butadiene and 0 to 50 percent by weight of a different ethylenically unsaturated monomer, the weight ratio of B to A being about 1:2 to 4:1.

4,200,568

POLYVINYLIDENE FLUORIDE COMPOSITIONS, AND FABRICATED PRODUCTS THEREOF HAVING INCREASED NOTCH IMPACT TOUGHNESS AND ELONGATION AT RUPTURE

Werner Trautvetter, Troisdorf-Spich, and Gregor Weisgerber, Königswinter-Berhausen, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 804,698, Jun. 8, 1977, abandoned, which is a continuation of Ser. No. 609,870, Sep. 2, 1975, abandoned. This application Feb. 12, 1979, Ser. No. 11,346

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1974, 2442173

Int. Cl.[2] C08L *27/16, 27/20*

U.S. Cl. 260—42.47 **31 Claims**

1. A cross-linkable composition comprising polyvinylidene fluoride and between 1 and 30 percent by weight of a fluoroelastomer having a reduced viscosity between 60 and 400 ml/g, measured at 30° C. on a 0.5 solution in acetone, said fluoroelastomer being a copolymer of 75–85 mol percent of vinylidene fluoride and 15–25 mol percent of hexafluoropropylene or pentafluoropropylene or a mixture thereof, said composition containing a chemical cross-linking agent.

4,200,569

WHEAT-BASED LIPOPROTEIN COMPLEXES AND METHODS OF MAKING AND USING SAME

Brian D. Ladbrooke, Saskatoon; Gary R. Quick, and Norman S. Singer, both of London, all of Canada, assignors to John Labatt Limited, London, Canada

Filed Apr. 17, 1978, Ser. No. 897,283

Int. Cl.[2] A23J *1/12*

U.S. Cl. 260—112 G **27 Claims**

1. A lipoprotein complex comprising gliadin reacted in an aqueous medium at a pH not greater than 7 and at a temperature less than about 70° C. witlh a polar anionic lipid, said lipid being selected from lipids which form a complex with gliadin wherein a 5 gram sample of the complex is extendable into a translucent film of approximate dimensions of 3 inches by 3 inches.

4,200,570

5-HALO-2-TRIFLUOROMETHYLPHENYLAZO-PYRAZOLONES

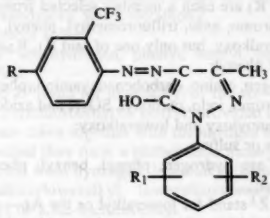
Russell I. Steiner, Reading, Pa., assignor to Crompton & Knowles Corporation, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,730

Int. Cl.[2] C09B *29/38;* **C09D** *11/00;* **D06P** *1/18, 3/54*

U.S. Cl. 260—163 **6 Claims**

1. A compound of the formula



where R is halogen, and R_1 and R_2 independently of one another are hydrogen, lower alkyl or halogen.

4,200,571

4-CHLOROAZETIDINONE

Saul Wolfe, Kingston, Canada, assignor to Queens University at Kingston, Kingston, Canada

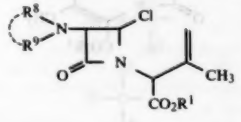
Division of Ser. No. 597,128, Jul. 21, 1975, Pat. No. 4,013,653. This application Mar. 7, 1977, Ser. No. 774,921

Claims priority, application United Kingdom, Jun. 8, 1974, 34614/74

Int. Cl.[2] C07D *205/08, 405/12, 405/04, 405/06*

U.S. Cl. 260—239 A **23 Claims**

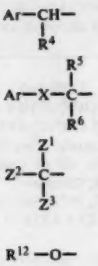
1. The compounds of the formula



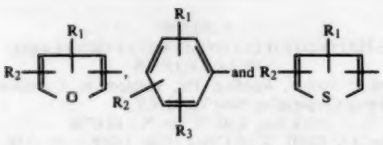
wherein

R^9 is hydrogen and R^8 is hydrogen or RCO—wherein

R stands for loweralkyl



wherein Ar is a monovalent radical selected from



wherein

R_1, R_2 and R_3 are each a member selected from hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R_1, R_2 and R_3 may represent phenyl;

R^4 is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO_3H and azido, hydroxy, loweralkanoyloxy and loweralkoxy;

X is oxygen or sulfur;

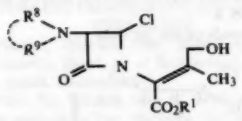
R^5 and R^6 are hydrogen, phenyl, benzyl, phenethyl and loweralkyl;

Z^1, Z^2 and Z^3 stand for loweralkyl or the Ar— group;

R^{12} is 2,2,2-trichloroethyl or benzyl; provided that when R^8 and R^9 are taken together with the nitrogen to which they are attached they form a phthalimido moiety;

R^1 is selected from hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxyloweralkyl, loweralkoxybenxyl, phenacyl, trimethylsilyl or 2,2,2-trichloroethyl.

5. The compounds of the formula

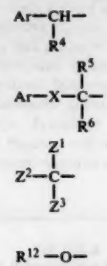


wherein

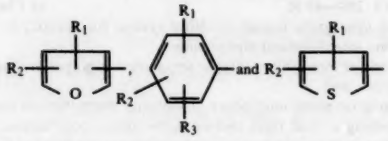
R^9 is hydrogen and R^8 is hydrogen or RCO—

wherein

R stands for loweralkyl



wherein Ar is a monovalent radical selected from



wherein

R_1, R_2 and R_3 are each a member selected from hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R_1, R_2 and R_3 may represent phenyl;

R^4 is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO_3H and azido, hydroxy, loweralkanoyloxy and loweralkoxy;

X is oxygen or sulfur;

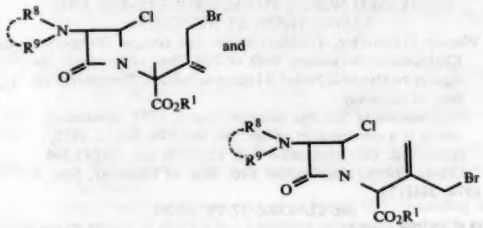
R^5 and R^6 are hydrogen, phenyl, benzyl, phenethyl and loweralkyl;

Z^1, Z^2 and Z^3 stand for loweralkyl or the Ar— group;

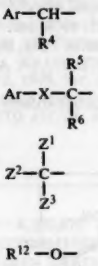
R^{12} is 2,2,2-trichloroethyl or benzyl; provided that when R^8 and R^9 are taken together with the nitrogen to which they are attached they form a phthalimido moiety,

R^1 is selected from hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxyloweralkyl, loweralkoxybenzyl, phenacyl, trimethylsilyl, or 2,2,2-trichloroethyl.

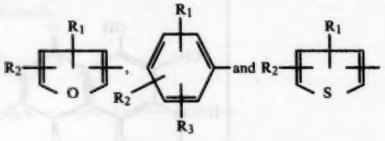
9. The compounds of the formula



wherein R^9 is hydrogen and R^8 is hydrogen or RCO—
wherein R stands for loweralkyl



wherein Ar is a monovalent radical selected from



wherein

R_1, R_2 and R_3 are each a member selected from hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R_1, R_2 and R_3 may represent phenyl;

R^4 is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO_3H and azido, hydroxy, loweralkanoyloxy and loweralkoxy;

X is oxygen or sulfur;

R^5 and R^6 are hydrogen, phenyl, benzyl, phenethyl and loweralkyl;

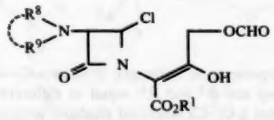
Z^1, Z^2 and Z^3 stand for loweralkyl or the Ar— group;

R^{12} is 2,2,2-trichloroethyl or benzyl;

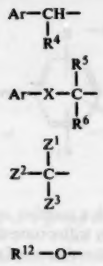
provided that when R^8 and R^9 are taken together with the nitrogen to which they are attached they form a phthalimido moiety;

R^1 is selected from hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxyloweralkyl, loweralkoxybenzyl, phenacyl, trimethylsilyl or 2,2,2-trichloroethyl.

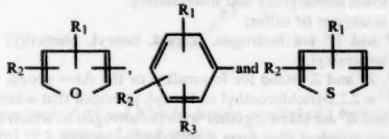
11. The compounds of the formula



wherein R^9 is hydrogen and R^8 is hydrogen or RCO— wherein R stands for loweralkyl



wherein Ar is a monovalent radical selected from



wherein

R_1, R_2 and R_3 are each a member selected from hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R_1, R_2 and R_3 may represent phenyl;

R^4 is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO_3H and azido, hydroxy, loweralkanoyloxy and loweralkoxy;

X is oxygen or sulfur;

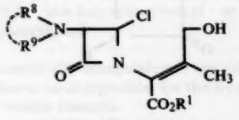
R^5 and R^6 are hydrogen, phenyl, benzyl, phenethyl and loweralkyl;

Z^1, Z^2 and Z^3 stand for loweralkyl or the Ar— group;

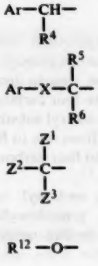
R^{12} is 2,2,2-trichloroethyl or benzyl; provided that when R^8 and R^9 are taken together with the nitrogen to which they are attached they form a phthalimido moiety;

R^1 is selected from hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxyloweralkyl, loweralkoxybenzyl, phenacyl, trimethylsilyl or 2,2,2-trichloroethyl.

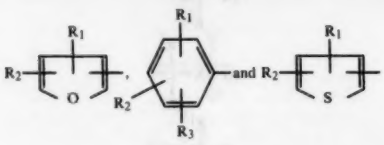
13. The compounds of the formula



wherein R^9 is hydrogen and R^8 is hydrogen or RCO— wherein R stands for loweralkyl



wherein Ar is a monovalent radical selected from



wherein

R_1, R_2 and R_3 are each a member selected from hydrogen, chloro, bromo, iodo, trifluoromethyl, phenyl, loweralkyl and loweralkoxy, but only one of said R_1, R_2 and R_3 may represent phenyl;

R^4 is hydrogen, amino, carbobenzoxyamino, phenyl, fluoro, chloro, bromo, iodo, carboxyl, SO_3H and azido, hydroxy, loweralkanoyloxy and loweralkoxy;

X is oxygen or sulfur;

R^5 and R^6 are hydrogen, phenyl, benzyl, phenethyl and loweralkyl;

Z^1, Z^2 and Z^3 stand for loweralkyl or the Ar— group;

R^{12} is 2,2,2-trichloroethyl or benzyl; provided that when R^8 and R^9 are taken together with the nitrogen to which they are attached they form a phthalimido moiety,

R^1 is selected from hydrogen, loweralkyl, benzyl, benzhydryl, loweralkoxyloeralkyl, loweralkoxybenzyl, phenacyl, trimethylsilyl or 2,2,2-trichloroethyl.

4,200,572

SUBSTITUTED AZETIDINONES

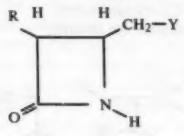
John G. Gleason, Delran; Kenneth G. Holden, Haddonfield, both of N.J., and William F. Huffman, Malvern, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 687,805, May 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,517, Sep. 3, 1975, Pat. No. 4,009,154. This application May 1, 1978, Ser. No. 901,951

Int. Cl.[2] C07D *205/08*

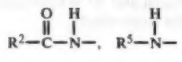
U.S. Cl. 260—239 A **13 Claims**

1. A compound of the formula:



in which:

R is NH_2,



or phthalimido;

R^2 is phenyl; phenoxymethyl; benzyl; α-aminobenzyl; α-hydroxybenzyl; α-carboxybenzyl; phenyl substituted with lower alkyl of from one to four carbon atoms, lower alkoxy of from one to four carbon atoms, trifluoromethyl, halo or hydroxy; or benzyl substituted on the phenyl ring with lower alkyl of from one to four carbon atoms, lower alkoxy of from one to four carbon atoms, trifluoromethyl, halo or hydroxy;

R^5 is trityl, t-butoxy carbonyl, trichloroethoxycarbonyl, benzyloxycarbonyl, p-methoxybenzyloxycarbonyl, isobornyloxycarbonyl or the methyl acetoacetate adduct; and

Y is azido or amino.

4,200,573

DERIVATIVES OF 3-CARBOXYRIFAMYCIN S AND SV AND PROCESS FOR THEIR PREPARATION

Mario Brufani, Castelgandolfo; Egidio Marchi, Casalecchio di Reno; Pierfranco Bellomo, Bologna, and Giuseppe Mascellani, Monte San Pietro, all of Italy, assignors to Alfa Farmaceutici, S.p.A., Bologna, Italy

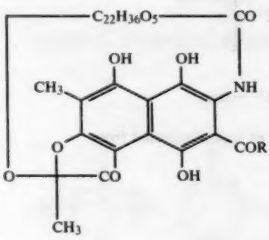
Filed Dec. 11, 1978, Ser. No. 968,409

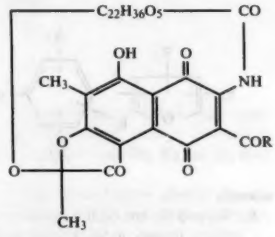
Claims priority, application Italy, Dec. 20, 1977, 3653 A/77

Int. Cl.[2] C07D *491/08*; A61K *31/33*

U.S. Cl. 260—239.3 P **18 Claims**

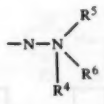
1. A derivative of 3-carboxyrifamycin S or SV of the formula:





wherein R represents a CN, a group OR' wherein R' represents a saturated aliphatic group having from 1 to 4 carbon atoms which may have substituents selected from OH, halogen and lower dialkylamino; R may also represent a group

wherein R^2 and R^3, equal or different from each other, represent an hydrogen atom, or a C_1–C_4 saturated aliphatic group or an aromatic group with 4 to 6 C atoms and may be substituted by bromine or by an amino group; R^2 and R^3 may form, together with the nitrogen atom which links them, a 6-member heterocyclic ring, which ring may contain 1 to 2 other heteroatoms selected from O and N; R may also represent the group



wherein R^4 represents an hydrogen atom or a C_1–C_4 saturated aliphatic group and R^5 and R^6, equal or different from each other, represent a C_1–C_4 saturated aliphatic group; R^4 and R^5 may form, together with the two nitrogen atoms, which link them, a 6-member heterocyclic ring; R^5 and R^6 may form, together with the nitrogen atom which links them, a 6-member

heterocyclic ring, which ring may also contain other heteroatoms selected from O and N and have substituents.

4,200,574

RIFAMYCIN DERIVATIVES AND PROCESS FOR THEIR PREPARATION

Egidio Marchi, and Lauretta Montecchi, both of Casalecchio Di Reno, Italy, assignors to Alfa Farmaceutici, S.p.A., Bologna, Italy

Filed Dec. 11, 1978, Ser. No. 968,410
Claims priority, application Italy, Dec. 20, 1977, 3654 A/77
Int. Cl.[2] C07D *491/08*; A61K *31/33*
U.S. Cl. 260—239.3 P **7 Claims**

1. 8-iminorifamycin S.

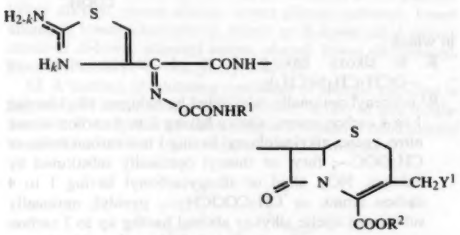
4,200,575

7[(2-THIAZOLYL)-2-(OXOIMINO)ACETAMIDO]CEPHALOSPORIN DERIVATIVES

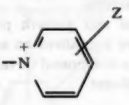
Mitsuo Numata, Takatsuki, and Tatsuo Nishimura, Ashiya, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Aug. 1, 1978, Ser. No. 930,041
Claims priority, application Japan, Aug. 6, 1977, 52-94469
Int. Cl.[2] A61K *31/545*; C07D *501/34, 501/36, 501/46*
U.S. Cl. 424—246 **25 Claims**

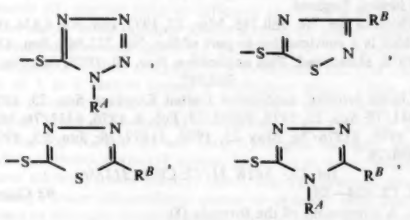
1. A 2-(syn)-carbamoyloximinoacetamido cephalosporin of the formula:



wherein Y^1 is (1) hydrogen, (2) hydroxyl, (3) carbamoyloxy, (4) acyloxy of the formula —OT where T is benzoyl or aliphatic carbonyl having 2 to 10 carbon atoms, (5) quaternary ammonium of the formula:



wherein Z is hydrogen, alkyl of 1 to 4 carbon atoms, carbamoyl, carboxyl, sulfo or alkoxy of 1 to 4 carbon atoms, (6) quinolinium, (7) picolinium, (8) lutidinium or (9) nitrogen-containing heterocyclic thio of the formula:



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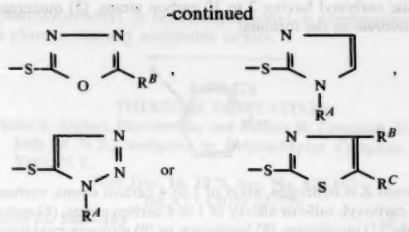


wherein R^A is hydrogen or a group of the formula $—(CH_2)_nP$ where n is an integer of 1 to 3 and P is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, a group of the formula —$COOR^4$ (where R^4 is hydrogen or alkyl of 1 to 4 carbon atoms), a group of the formula

(where each of R^5 and R^6 is hydrogen or alkyl of 1 to 4 carbon atoms) or a group of the formula

(where R^5 and R^6 are as defined above); and R^B and R^C may be the same or different and each represents hydrogen, amino, carbamoyl, a group of the formula —$NHCOOR^7$ (where R^7 is alkyl of 1 to 4 carbon atoms), a group of the formula $—S—(CH_2)_nQ$ (where n is an integer of 1 to 3 and Q is carboxyl, hydroxyl, hydrogen or sulfo) or a group of the formula $—(CH_2)_nP$ (where n and P are as defined above),

R^1 is alkyl of one to six carbons, cycloalkyl of five to six carbons, phenyl, benzyl, phenethyl, phenylpropyl or phenylbutyl,

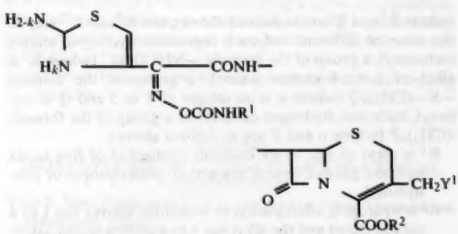
R^2 is hydrogen, alkoxy-alkyl in which the alkoxy has 1 to 4 carbon atoms and the alkyl has 1 to 4 carbon atoms, alkylthiomethyl in which the alkyl has 1 to 4 carbon atoms, pivaloyloxymethyl, alkoxycarbonyloxymethyl in which the alkoxy has 1 to 4 carbon atoms, 2-n-propionyloxyethoxymethyl, α-n-butyryloxybenzyl or 3-methoxy-4-acetyloxybenzyl, and

k is 0 or 1,

or a pharmaceutically acceptable salt thereof.

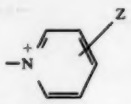
25. An antibacterial composition for the treatment of bacterial infections which contains

(A) a pharmaceutically effective amount of a 2-(syn)-carbamoyloximinoacetamido cephalosporin of the formula:

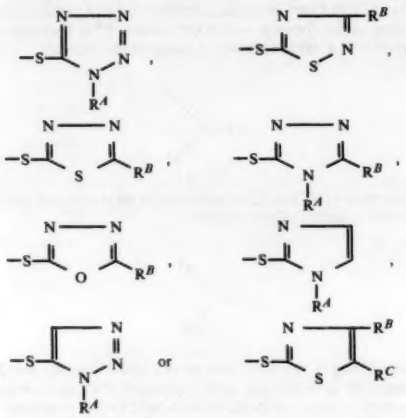


wherein Y^1 is (1) hydrogen, (2) hydroxyl, (3) carbamoyloxy, (4) acyloxy of the formula —OT where T is benzoyl or ali-

phatic carbonyl having 2 to 10 carbon atoms, (5) quaternary ammonium of the formula:



wherein Z is hydrogen, alkyl of 1 to 4 carbon atoms, carbamoyl, carboxyl, sulfo or alkoxy of 1 to 4 carbon atoms, (6) quinolinium, (7) picolinium, (8) lutidinium or (9) nitrogen-containing heterocyclic thio of the formula:



wherein R^A is hydrogen or a group of the formula $-(CH_2)_nP$ where n is an integer of 1 to 3 and P is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, a group of the formula $-COOR^4$ (where R^4 is hydrogen or alkyl of 1 to 4 carbon atoms), a group of the formula

(where each of R^5 and R^6 is hydrogen or alkyl of 1 to 4 carbon atoms) or a group of the formula

(where R^5 and R^6 are as defined above); and R^B and R^C may be the same or different and each represents hydrogen, amino, carbamoyl, a group of the formula $-NHCOOR^7$ (where R^7 is alkyl of 1 to 4 carbon atoms), a group of the formula $-S-(CH_2)_nQ$ (where n is an integer of 1 to 3 and Q is carboxyl, hydroxyl, hydrogen or sulfo) or a group of the formula $-(CH_2)_nP$ (where n and P are as defined above),

R^1 is alkyl of one to six carbons, cycloalkyl of five to six carbons, phenyl, benzyl, phenethyl, phenylpropyl or phenylbutyl,

R^2 is hydrogen, alkoxy-alkyl in which the alkoxy has 1 to 4 carbon atoms and the alkyl has 1 to 4 carbon atoms, alkylthiomethyl in which the alkyl has 1 to 4 carbon atoms, pivaloyloxymethyl, alkoxycarbonyloxymethyl in which the alkoxy has 1 to 4 carbon atoms, 2-n-propionyloxyethoxymethyl, α-n-butyryloxybenzyl or 3-methoxy-4-acetyloxybenzyl, and

k is 0 or 1,

or a pharmaceutically acceptable salt thereof, and

(B) a pharmaceutically acceptable carrier therefor.

4,200,576

BETA-LACTAM ANTIBIOTICS

Peter Feyen, Mettmann; Michael Preiss, and Karl G. Metzger, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

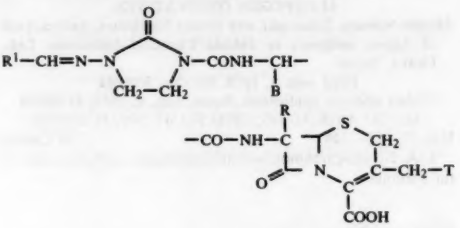
Filed Dec. 20, 1977, Ser. No. 862,466

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658718; Jun. 20, 1977, 2727586

Int. Cl.[2] A61K *31/545;* **C07D** *501/20*

U.S. Cl. 424—246 **22 Claims**

1. A cephalosporin compound of the formula



in which

R is alkoxy having 1 to 4 carbon atoms or $-OCH_2CH_2N(CH_3)_2$,

R^1 is phenyl optionally substituted by halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, cyano, alkylsulphonyl having 1 to 4 carbon atoms or CH_3OOC—; furyl or thienyl optionally substituted by halogen, NO_2, alkyl or alkoxycarbonyl having 1 to 4 carbon atoms, or CH_3COOCH_2—; pyridyl; optionally substituted cyclic alkyl or alkenyl having up to 7 carbon atoms; or optionally substituted alkyl or alkenyl having up to 4 carbon atoms,

B is phenyl, hydroxyphenyl or cyclohexadienyl,

T is hydrogen, O—CO—CH_3, hydroxyl, or thiadiozolylthio or tetrazolylthio optionally substituted by alkyl having 1 to 4 carbon atoms or by CF_3,

or a salt or hydrate thereof.

14. An antibacterial and growth promoting composition containing as an active ingredient an antibacterial or growth promoting amount of a compound or salt according to claim **1** in admixture with a diluent.

4,200,577

COUMARIN DERIVATIVES

Derek R. Buckle, Redhill, and Harry Smith, Maplehurst, Nr. Horsham, both of England, assignors to Beecham Group Limited, England

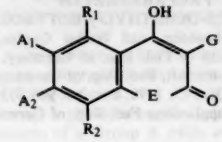
Division of Ser. No. 780,246, Mar. 22, 1977, Pat. No. 4,136,192, which is a continuation-in-part of Ser. No. 722,868, Sep. 13, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,387

Claims priority, application United Kingdom, Sep. 23, 1975, 39041/75; Sep. 23, 1975, 39042/75; Feb. 4, 1976, 4321/76; May 22, 1976, 21276/76; May 22, 1976, 21277/76; Jun. 12, 1976, 24450/76

Int. Cl.[2] A61K *31/37;* **C07D** *311/56*

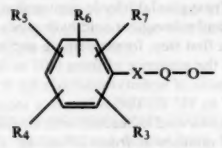
U.S. Cl. 424—281 **93 Claims**

1. A compound of the formula (I):



(I)

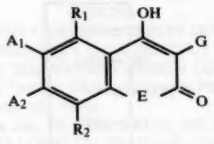
or a pharmaceutically accetpable salt thereof wherein one of A_1 or A_2 is a group of the formula (II)



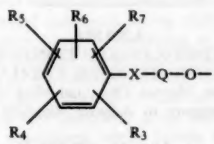
(II)

and R_1, R_2 and the one of A_1, or A_2 which is not a group of the formula (II) are the same or different and each is hydrogen, lower alkyl, lower alkoxy, lower alkenyl or lower alkynyl; provided that at least one of R_1, R_2, A_1 and A_2 is hydrogen, E is oxygen; G is nitro or cyano; X is methylene; and Q is alkylene of 1 to 8 carbon atoms. 1 methylene group within the group Q, other than a methylene covalently bound to an ether oxygen, being unsubstituted or substituted by hydroxyl, and R_3, R_4, R_5, R_6 and R_7 are each hydrogen, halogen, nitro, hydroxy, cyano, carboxyl, amino, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxy carbonyl, lower alkanoyl, lower alkanoyloxy, mono- or di-lower alkyl amino, mono-or di-lower alkanoyl amino, phenyl, lower alkylphenyl, phenoxycarbonyl, or benzyloxycarbonyl.

62. A method of inhibiting mediators of allergic response in humans and for inhibiting in humans the action of said mediators which comprises administering to a human in need thereof an effective amount of a compound of the formula (I):



or a pharmaceutically acceptable salt thereof wherein one of A_1 A_2 is a group of the formula (II):



and R_1, R_2 and the one of A_1 or A_2 which is not a group of the formula (II) are the same or different and each is hydrogen, lower alkyl, lower alkoxy, lower alkenyl or lower alkynyl; provided that at least one of R_1, R_2, A_1 and A_2 is hydrogen, E is oxygen; G is nitro or cyano; X is methylene; and Q is alkylene of 1 to 8 carbon atoms, 1 methylene group within the group Q, other than a methylene covalently bound to an ether oxygen, being unsubstituted or substituted by hydroxyl, and R_3, R_4, R_5, R_6 and R_7 are each hydrogen, halogen, nitro, hydroxy, cyano, carboxyl, amino, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxy carbonyl, lower alkanoyl, lower alkanoyloxy, mono- or di-lower alkyl amino, mono- or di-lower alkanoyl amino, phenyl, lower alkylphenyl, phenoxycarbonyl, or benzyloxycarbonyl, in combination with a pharmaceutically acceptable carrier.

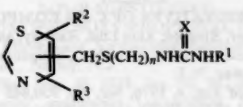
4,200,578

THIAZOLE DERIVATIVES

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,517
Int. Cl.[2] C07D *277/20*
U.S. Cl. 548—193 **16 Claims**

1. A compound of the formula



I

wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive; R^2 and R^3 each are independently hydrogen, (lower)alkyl, guanidino or $-(CH_2)_pNR^4R^5$; R^4 and R^5 each are independently hydrogen, (lower)alkyl or phenyl; n is 2 or 3; p is 1, 2 or 3; X is NR^6 or CHR^6; R^6 is cyano, nitro, SO_2Ar or SO_2(lower)alkyl; and Ar is phenyl or phenyl containing 1 or 2 substituents selected from halogen and (lower)alkyl; or a nontoxic, pharmaceutically acceptable salt thereof.

4,200,579

COMPOSITIONS POSSESSING INCREASED BUILDING TACK ON THE BASIS OF NEW RUBBER-LIKE COPOLYMERS OF ETHYLENE, AT LEAST ONE OTHER α-ALKENE AND ONE OR MORE POLYENES

Albertus J. Pennings, Norg, and Arnold Vossebeld, Beek, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 458,036, Apr. 4, 1974, abandoned, which is a division of Ser. No. 411,402, Oct. 31, 1973, abandoned, which is a continuation-in-part of Ser. No. 381,091, Jul. 20, 1973, abandoned, which is a continuation of Ser. No. 291,163, Sep. 22, 1972, abandoned. This application Nov. 19, 1976, Ser. No. 743,331
Claims priority, application Netherlands, Sep. 24, 1971, 7113143; Sep. 24, 1971, 7113144
Int. Cl.[2] C08K *3/04, 5/01*; C08L *9/00, 19/00*
U.S. Cl. 260—33.6 AQ **16 Claims**

1. A tackified rubbery composition composed of a rubbery copolymer, said rubbery copolymer composed of 20 to 75 percent by weight of ethylene, 24 to 79 percent by weight of another α-alkene having 3–8 carbon atoms, and from 0.1 to 10 percent by weight of one or more dienes, the total of said components constituting said rubbery copolymer amounting to 100 percent by weight, said rubbery copolymer having thermogram recorded by differential scanning calorimetry (d.s.c.) at a cooling rate of 8° C./min indicating a curve of crystallization heat as a function of temperature having a peak which passes through a maximum at a temperature between −7° and +11° C.

and a tackifying amount of at least one rubber compounding tackifier.

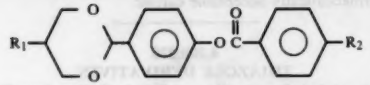
4,200,580

DIOXANYLPHENYL BENZOATE LIQUID CRYSTAL COMPOUNDS

Ying Y. Hsu, Bridgewater, N.J., assignor to Timex Corporation, Waterbury, Conn.

Filed Mar. 5, 1979, Ser. No. 17,634
Int. Cl.[2] C07D *319/04*
U.S. Cl. 260—340.7 **3 Claims**

1. A compound of the formula:



wherein R_1 is an alkyl group having 1 to 10 carbon atoms and R_2 is an alkyl, alkoxy, acyloxy, alkyl carbonato group having 1 to 10 carbon atoms, CN or NO_2.

4,200,581

ALKYL DERIVATIVES OF C-076 COMPOUNDS

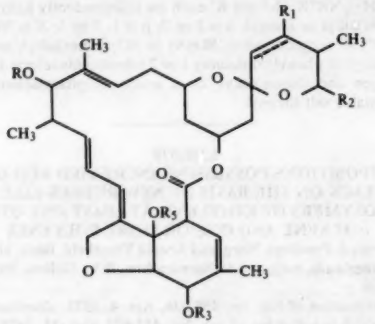
Michael H. Fisher, Ringoes; Aino Lusi, Rahway, and Richard L. Tolman, Berkeley Heights, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Aug. 4, 1978, Ser. No. 930,845

Int. Cl.[2] **C07H** *17/08;* **C07D** *493/22;* **A61K** *31/71, 31/365*

U.S. Cl. 424—180 **24 Claims**

1. A compound having the formula:



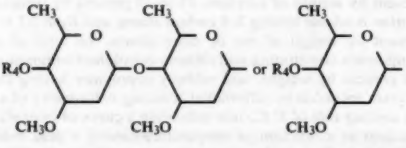
wherein the broken line indicates a single or double bond;

R_1 is hydroxy, loweralkanoyloxy or a hydrocarbonoxy and is present only when the broken line indicates a single bond;

R_2 is iso-propyl or sec-butyl;

R_3 is hydrogen, methyl, loweralkanoyl or a hydrocarbon; and

R is hydrogen, loweralkanoyl, a hydrocarbon, or



wherein R_4 is hydrogen, loweralkanoyl or a hydrocarbon;

R_5 is hydrogen or methyl; and said hydrocarbonoxy group of R_1 is an alkoxy of from 1 to 10 carbon atoms or an alkoxy of from 1 to 10 carbon atoms substituted with phenyl and said hydrocarbon group in R, R_1, and R_4 is an alkyl of from 1 to 10 carbon atoms or an alkyl of from 1 to 10 carbon atoms substituted by phenyl; and said hydrocarbon group in R_3 is an alkyl of from 1 to 10 carbon atoms substituted by phenyl provided that at least one of the R, R_1, R_3, or R_4 is or contains a hydrocarbon or R_5 is methyl.

23. A method for the treatment of parasitic infections which comprises administering to a host infected with parasitic infections, an effective amount of a compound of claim 1.

4,200,582

PREPARATION OF α-HYDROXY-β,β-DIMETHYL-γ-BUTYROLACTONE

Harry Distler, Bobenheim, and Walter Goetze, Dannstadt-Schauernheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,662

Claims priority, application Fed. Rep. of Germany, Dec. 30, 1977, 2758883

Int. Cl.[2] **C07D** *307/58*

U.S. Cl. 260—343.6 **1 Claim**

1. A process for the preparation of α-hydroxy-β,β-dimethyl-γ-butyrolacetone by condensation of formaldehyde and isobutyraldehyde, to hydroxypivalaldehyde conversion of the latter to its cyanohydrin, and subsequent acid hydrolysis and lactonization, wherein, in a first step, formaldehyde and isobutyraldehyde are reacted in the presence of from 0.01 to 0.3 mole of a tertiary amine per mole of isobutyraldehyde for from 30 to 50 minutes at from 80° to 95° C., thereafter, in a second step, the reaction mixture thus formed in reacted with hydrocyanic acid for from 60 to 120 minutes at from 20° to 45° C., with the concentration of the hydrocyanic acid not exceeding 1 percent by weight, based on the reaction mixture, during the reaction, and thereafter, in a third step, the resulting mixture is reacted with gaseous hydrogen chloride.

4,200,583

NEW PLATINUM COMPLEX

Yoshinori Kidani, 2-1, Mataho-cho,, Nishi-ku, Nagoya-shi, Aichi-ken, Japan, and Masahide Noji, both of Nagoya, Japan, assignors to Yoshinori Kidani, Tokyo, Japan

Filed Sep. 12, 1978, Ser. No. 941,559

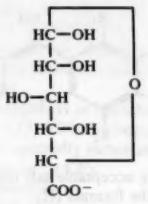
Claims priority, application Japan, Sep. 12, 1977, 52-108921

Int. Cl.[2] **C07D** *309/22, 309/28*

U.S. Cl. 260—345.7 R **9 Claims**

1. Cis-Pt(II)(cis-1,2-diaminocyclohexane)($BrCH_2CO_2$)$_2$.

4. Cis-Pt(II)(cis-1,2-diaminocyclohexane)(D-GlucH)NO_3 wherein GlucH is



4,200,584

MALEIC ANHYDRIDE PRODUCTION OVER MODIFIED PHOSPHOTUNGSTIC CATALYST

Svend E. Pedersen, Mentor, Ohio, and Ming N. Sheng, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 853,970, Nov. 21, 1977, Pat. No. 4,143,056. This application Dec. 5, 1978, Ser. No. 966,550

The portion of the term of this patent subsequent to Mar. 6, 1996, has been disclaimed.

Int. Cl.[2] **C07D** *307/60*

U.S. Cl. 260—346.75 **18 Claims**

1. In the method for the production of an effluent stream containing maleic anhydride, said method using a feed gas stream comprising a major amount of carrier gas, a controlled amount of oxygen, and a controlled amount of an unsaturated aliphatic normal hydrocarbon containing 4 or 5 carbon atoms, the proportions of oxygen and hydrocarbon providing in said feed gas stream a non-explosive mixture at reaction conditions, and said feed gas stream is converted at a temperature from

250° C. to 650° C. in a catalytic zone to form an effluent stream containing maleic anhydride, the improvement which consists of:

employing as the catalyst in said catalytic zone a catalyst having as active ingredients the oxides of tungsten, phosphorus, a Group A metal and a multivalent metal, said catalyst being a phosphotungstic catalyst modified by minor amounts of a Group A oxide and the oxide of a multivalent metal having an atomic number from 21 to 47, the sum of the oxides of the Group A metal and the multivalent metal (i.e. M) constituting from 1% to 15% by weight of the catalyst, the atom ratio of A:M being within the range from about 1:1 to about 8:1, and the overall atomic ratios are such that W:P:A:M correspond to 1:0.1–0.7:0.01–0.16:0.01–0.1.

4,200,585

ACID ESTERS OF PROPYLENE OXIDE POLY-ADDUCTS

Alfred Berger, Reinach, and Hans-Ulrich Berendt, Allschwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 685,585, May 12, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 920,588

Claims priority, application Switzerland, Jun. 4, 1975, 7173/75

Int. Cl.[2] C07C *141/08*

U.S. Cl. 260—458 R **9 Claims**

1. An acid ester of propylene oxide polyadduct, which is obtained by acid reaction of 15 to 100 mols of

(a) propylene oxide with

(b) 1 mol of an alkylene polyamine containing 2 to 6 carbon atoms and 2 to 4 amino groups or of an alkanolamine of 2 to 6 carbon atoms and esterification of the polyadduct with

(c) an oxy-acid selected from the group consisting of sulfuric acid, chloro-sulfonic acid and sulphamic acid, as the free acid, the alkali metal salt or the ammonium salt.

4,200,586

INHIBITING THE CARBON-CARBON DOUBLE BOND ISOMERIZATION OF SUBSTITUTED OR UNSUBSTITUTED HYDROCARBON COMPOUNDS

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 10, 1978, Ser. No. 868,370

Int. Cl.[2] C07C *121/30, 121/48, 121/70*

U.S. Cl. 260—464 **29 Claims**

1. A method comprising:

inhibiting the carbon-carbon double bond isomerization of a first compound having olefinic unsaturation in a less stable form to a second compound having olefinic unsaturation in a more stable form by contacting at least one alkali metal salt of a di-, tri-, or tetracarboxylic acid with said first compound in an amount sufficient to at least substantially inhibit the formation of said second compound, wherein said first compound is an acyclic or alicyclic olefinically unsaturated nitrile having 4 to 30 carbon atoms per molecule and having the —C≡N substituent attached to a carbon atom which is at least two carbon atoms, inclusive of the substituent-bearing carbon atom, removed from the nearest carbon atom of the olefinic double bond, and wherein said at least one alkali metal salt of a di-, tri-, or tetracarboxylic acid is represented by the general formula

$$MO_2C—R(CO_2Z)_n$$

wherein n is an integer having a value of 1, 2 or 3,

wherein M is selected from the group consisting of lithium, sodium, potassium, rubidium and cesium,

wherein each Z is independently selected from the group consisting of hydrogen, lithium, sodium, potassium, rubidium and cesium, and

wherein R is selected from the group consisting of a valence bond, a hydrocarbyl radical having from 1 to 8 carbon atoms and having a valence equal to n+1, and a hydroxy substituted hydrocarbyl radical having from 1 to 8 carbon atoms and having a valence equal to n+1.

4,200,587

2-[P-(P-SUBSTITUTED PHENOXY)PHENOXY]PROPIONYL OXIMES

Milos Suchy, Pfaffhausen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

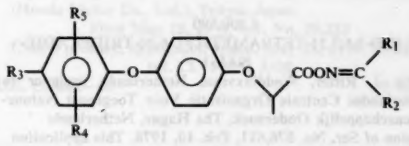
Filed Nov. 20, 1978, Ser. No. 962,087

Claims priority, application Luxembourg, Nov. 28, 1977, 78591; Switzerland, Sep. 15, 1978, 9667/78

Int. Cl.[2] C07C *131/00, 131/02, 131/04*

U.S. Cl. 260—566 AE **20 Claims**

1. A compound of the formula



I

wherein R_1 is hydrogen, alkyl of from 1 to 6 carbons, or phenyl, R_2 is hydrogen, alkyl of from 1 to 6 carbons, alkenyl of from 2 to 6 carbons, alkynyl of from 2 to 6 carbons or phenyl, or R_1 and R_2, together form a cyclohexane ring, which can be mono- or dissubstituted with alkyl of from 1 to 3 carbons, R_3 is hydrogen, fluorine, chlorine, bromine, trifluoromethyl or nitro and R_4 and R_5 are hydrogen or chlorine, with the proviso that R_1 and R_2 are not both hydrogen;

and optical and geometric isomers thereof.

4,200,588

POLYCYCLOANILINES

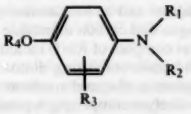
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 576,342, May 12, 1975, Pat. No. 4,036,977, which is a continuation-in-part of Ser. No. 507,462, Sep. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,402, Nov. 16, 1973, abandoned. This application May 26, 1977, Ser. No. 800,799

Int. Cl.[2] C07C *93/14*

U.S. Cl. 260—571 **13 Claims**

1. A compound of the formula



wherein R_1 and R_2 are the same or different and are hydrogen or alkyl of one to three carbon atoms, inclusive; R_3 is hydrogen, fluoro, or chloro; R_4 is 1-adamantyl, 2-methyl-2-adamantyl, 1-diamantyl and 4-diamantyl and pharmacologically acceptable acid addition salts thereof.

4,200,589

PROCESS FOR PREPARING ACETONE FROM ISOBUTYRALDEHYDE

Helmut Scharf, Schermbeck, Fed. Rep. of Germany, assignor to Chemische Werke Hüls A.G., Marl, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,579

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1978, 2802672

Int. Cl.[2] C07C 45/00

U.S. Cl. 260—593 R 8 Claims

1. In a process for the preparation of acetone by the catalytic oxidative decarbonylation of isobutyraldehyde in the gaseous phase, wherein a gaseous mixture comprising isobutyraldehyde and oxygen is contacted with a metal oxide catalyst containing copper oxide or manganese oxide for contact times of about 0.1 to 10 seconds, the improvement comprising:

said gaseous mixture comprising about 1 to 4.5 vol. % of isobutyraldehyde and about 1.2 to 99 vol. % of oxygen, said process is conducted at a temperature of about 130° to 180° C., and said metal oxide catalyst consists of about 0.1 to 6% by weight of Cu, Mn, or a mixture thereof, in the form of their oxides and of about 1 to 10% by weight of Zn in the form of zinc oxide on aluminum oxide as a carrier.

4,200,590

(6E,10Z)-3,4,7,11-TETRAMETHYL-6,10-TRIDECADIENAL-1

Fridolin J. Ritter, Waddinxveen, Netherlands, assignor to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

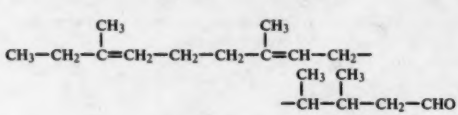
Division of Ser. No. 876,611, Feb. 10, 1978. This application Aug. 11, 1978, Ser. No. 932,712

Claims priority, application United Kingdom, Feb. 14, 1977, 6086/77

Int. Cl.[2] C07C 47/20

U.S. Cl. 260—601 R 2 Claims

1. A compound having the general formula:



4,200,591

CATALYTIC HYDROFORMYLATION

Rosemary R. Hignett, Reading, and Peter J. Davidson, Woodcote, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jun. 19, 1978, Ser. No. 916,534

Claims priority, application United Kingdom, Jun. 21, 1977, 25856/77

Int. Cl.[2] C07C 45/10

U.S. Cl. 260—604 HF 22 Claims

1. A process for the production of a straight chain aldehyde from an internal olefin selected from the group consisting of 2-pentene, 2-hexene, 3-hexene and 2-butene which comprises reacting said olefin at a temperature of 115° to 140° C. in a liquid reaction medium and at an elevated pressure less than 200 psi with hydrogen and carbon monoxide in the presence of an hydride carbonyl complex of Rh(I) including a triaryl phosphine or triaryl phosphite stabilizing donor ligand, said complex being in solution in the said medium as catalyst and a heterogeneous co-catalyst comprising a catalytic metal deposited upon a solid particulate support, said catalytic metal being a metal selected from the group consisting of Ru, Rh, Pd, Ir, Pt and alloys thereof in which at least 10% by weight of one or more of the said metals is present, the molar ratio in the reaction medium of catalytic metal deposited upon the catalyst support to catalyst being within the range 20:1 to 1:20.

4,200,592

CATALYTIC HYDROFORMYLATION

Rosemary R. Hignett, Reading, and Peter J. Davidson, Woodcote, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Jun. 19, 1978, Ser. No. 916,535

Claims priority, application United Kingdom, Jun. 21, 1977, 25857/77; Aug. 19, 1977, 34920/77

Int. Cl.[2] C07C 45/10

U.S. Cl. 260—604 HF 24 Claims

1. A process for the production of a straight chain aldehyde from an internal olefin selected from the group consisting of 2-pentene, 2-hexene, 3-hexene and 2-butene which comprises reacting the said olefin at a temperature between 80° and 140° C. in a liquid reaction medium with hydrogen and carbon monoxide at a total pressure of at least 1 atmosphere and less than 500 psig in the presence of an hydrido carbonyl complex of Rh(I) including a triaryl phosphite or triaryl phosphine stabilizing donor ligand, said complex being in solution in the said medium and a homogeneous co-catalyst also dissolved in said reaction medium comprising a co-ordination compound selected from the group consisting of $Pd(acac)_2$, $(PhCN)_2PdCl_2$, $Mo(CO)_6$, $Fe_2(CO)_9$, $Co_2(CO)_8$, $Cr(CO)_6$, $Ru_3(CO)_{12}$, $W(CO)_6$, $Pt(PPh_3)_4$ and $Pd(PPh_3)_4$, the molar ratio of co-catalyst complex present to Rh(I) complex present being greater than 1:1.

4,200,593

PROCESS FOR THE PREPARATION OF COPOLYMERS CONTAINING LOW MONOMER CONTENT

Jozef L. M. van der Loos, Sittard, and Wilhelmus G. Duijzings, Born, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jul. 17, 1978, Ser. No. 925,626

Claims priority, application Netherlands, Jul. 19, 1977, 7708002

Int. Cl.[2] C08F 212/06, 212/10; C08L 9/00

U.S. Cl. 525—243 15 Claims

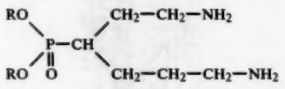
1. In a process for the preparation of a copolymer by the polymerization of about 25 to 85 parts by weight of a monomer selected from group A consisting of styrene, α-methylstyrene and a combination thereof, and about 15 to 75 parts by weight of a monomer selected from group B consisting of acrylonitrile, methacrylonitrile and a combination thereof, in an aqueous dispersion of said monomers in the presence of a first at least one compound yielding free radicals, thereby forming an aqueous reaction medium containing said copolymer as well as remaining non-converted monomer, the improvement comprising carrying out said polymerization in said dispersion in the additional presence of a synthetic rubber-like polymer and adding to said reaction medium while at a temperature of between 30° and 120° C., a second at least one compound yielding water-soluble free radicals, having a half-life of less than five hours and in a quantity of between about 0.05 to 2.5 parts per 100 parts by weight of monomer and copolymer in said reaction medium, said addition taking place at a point of time at which (a) the rate of conversion of monomer to said copolymer is less than 15% per hour, (b) the degree of conversion of monomer to said copolymer is greater than 75%, and (c) the amount of non-converted monomer from said group B remaining in said reaction medium is at least 0.1% by weight relative to the total weight of said reaction medium, and whereafter no additional monomer is added to said reaction medium.

4,200,594
3-(1,6-)DIAMINOHEXYL-DILOWERALKYL) PHOSPHONATES

Georges Sturtz, 22, rue Léon Blum, 29200 Brest, and Jean-Claude Clement, 76106 Residence Bois des Roches, 91240 Saint Michel sur Orge, both of France

Division of Ser. No. 801,809, May 31, 1977, abandoned, which is a division of Ser. No. 693,686, Jun. 7, 1976, abandoned. This application Dec. 19, 1977, Ser. No. 861,948
Claims priority, application France, Jun. 10, 1975, 75 18179
Int. Cl.[2] C07F 9/30
U.S. Cl. 260—944 2 Claims

1. A compound of the formula



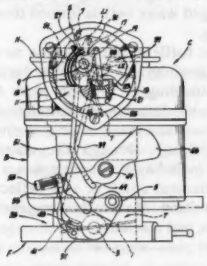
wherein R is a branched or unbranched alkyl containing 1 to 5 carbon atoms.

2. The compound as defined in claim 1 which is 3-(1,6-diaminohexyl)diethylphosphonate.

4,200,595
CARBURETOR

S. Owen Dye, Highland, Ill., assignor to ACF Industries, Inc., New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,308
Int. Cl.[2] F02M 11/06
U.S. Cl. 261—39 B 12 Claims



1. A carburetor for an internal combustion engine comprising:

a carburetor body in which an induction passage is formed for air to be drawn into said engine;

a throttle valve positioned in said induction passage and movable between a closed and an open position to control the quantity of air drawn into said engine;

an unbalanced staging valve positioned in said induction passage and movable between a closed and an open position, said staging valve being substantially closed during cranking of the engine whereby a suitable rich air-fuel mixture is supplied to the engine to start it;

vacuum means for moving said staging valve to a first open position when said engine starts;

thermostatic means for allowing said staging valve to move from its first open position toward its fully open position as said engine warms up;

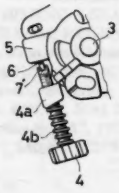
means including first and second levers for limiting the opening movement of said staging valve to a second open position which is intermediate its first open position and its fully open position, the limiting of said staging valve to this second and less than fully open position limiting the usable air capacity of said carburetor; and

staging means for increasing the usable air capacity of said carburetor, said staging means being responsive to the movement of said throttle valve past a predetermined open position for moving at least one of said levers to enable said staging valve to move freely between its second open position and a more fully open position solely in response to the demand for air by said engine, the more fully open position to which said staging valve is moved being determined by the position past the predetermined open position to which said throttle valve is moved, said staging valve being freely movable to its fully open position when said throttle valve is fully opened, the free movement of said staging valve to its fully open position increasing the usable air capacity of said carburetor to its maximum capacity, and said thermostatic means together with said vacuum means limiting the position to which said staging valve is moved when the throttle valve is closed to between the abovesaid first and second open positions during engine warmup.

4,200,596
THROTTLE VALVE APPARATUS IN AN INTERNAL COMBUSTION ENGINE AND ITS METHOD OF OPERATION

Masahiko Iiyama, Tokyo, and Kazunori Itaya, Fujimi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.), Tokyo, Japan

Filed May 15, 1979, Ser. No. 39,332
Claims priority, application Japan, May 18, 1978, 53-58292
Int. Cl.[2] F02M 3/08
U.S. Cl. 261—65 9 Claims



1. In throttle valve apparatus in an internal combustion engine in which a throttle valve is stopped, in the course of its travel in a closing direction, in an idling position by a stopper member which contacts a receiving member fixed to the throttle valve, the improvement wherein at least one of the stopper member or the receiving member on the throttle valve is provided with a portion which can be easily deformed or worn, so that in an initial stage after the commencement of use of the engine, said portion is gradually deformed or worn whereby the idling position of the throttle valve is gradually shifted in the direction of closing of the throttle valve.

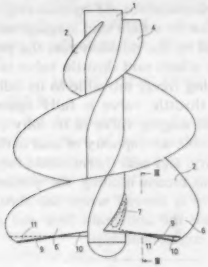
4,200,597
DEVICE FOR REVOLVING LIQUIDS AND SUPPLYING GAS THERETO

Engelbert Baum, Vienna, Austria, assignor to Alfa-Laval Stalltechnik GmbH, Wien, Austria

Filed Aug. 18, 1978, Ser. No. 935,002
Claims priority, application Austria, Aug. 26, 1977, 6215/77
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—87 2 Claims

1. A device for supplying gas to a liquid and revolving the liquid, especially manure, sewage containing bacteria, or the like, said device comprising a driven hollow shaft which is generally vertical, and at least one screw-shaped vane carried by said shaft and forming a propeller means adapted to be immersed in said liquid, said vane having a lower edge portion which widens to a chamber, said shaft having a channel through which said chamber communicates with the interior of the hollow shaft, said chamber having at its lower portion an

outlet opening positioned to discharge into said liquid a gas supplied through said shaft interior and said channel into said chamber, said vane having two downwardly diverging screw-



shaped surfaces forming said chamber, said chamber having a V-shaped cross section with the apex thereof pointing outwardly from the hollow shaft.

4,200,598

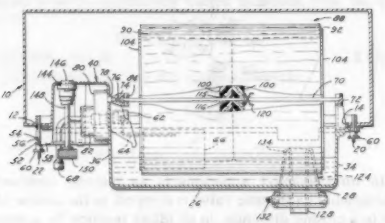
ROTARY DRUM HUMIDIFIER

Richard J. Yeagle, Hartland, Mich., assignor to General Filters, Inc., Novi, Mich.

Division of Ser. No. 948,721, Oct. 5, 1978. This application Feb. 21, 1979, Ser. No. 13,104

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—92 **4 Claims**



1. A power humidifier having an on-off cycle and adapted to operate with a furnace which generates a time-temperature curve during its heating cycle, with the temperature capable of being plotted on the ordinate of a graph and the time capable of being plotted on the abscissa of the graph to form the curve which is generally sloped upward during the furnace burner-blower phase and is generally sloped downward during the cool down phase, said humidifier comprising a housing, evaporator means mounted in the housing, means for supplying water to said evaporator means to humidify the air passing through said evaporator means, an electrical circuit for the power humidifier including an adjustable thermostat interposed in said electrical circuit and effective to move the on-off cycle of the humidifier up or down the ordinate of the curve generated by the furnace heating cycle, said adjustable thermostat having a manually operated control knob for selecting on and off positions and low, medium and high humidity settings for said thermostat, said thermostat being adapted to control and to provide an adjustable humidifier daily evaporative output depending on the setting of the thermostat, said adjustable thermostat turning the humidifier on at the start of a furnace heating cycle and turning the humidifier off at the end of a furnace heating cycle, said adjustable thermostat completing the electrical circuit on rising temperature and sensing the peaks and valleys of the modulating temperature caused by the furnace heating cycle, the operating time of the humidifier as determined by the setting of said adjustable thermostat being the part of the abscissa below and within the time-temperature curve.

4,200,599

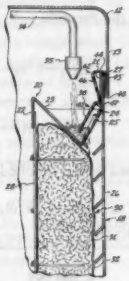
MOISTURE ENTRAINMENT BAFFLE FOR EVAPORATIVE COOLERS

Adam D. Goettl, 4960 E. Palomino Rd., Phoenix, Ariz. 85018

Filed Jun. 8, 1978, Ser. No. 913,889

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—97 **11 Claims**



1. An improved cooler pad assembly for an evaporative cooler, said cooler pad assembly including a louver plate having a top edge with a water distribution trough adjacent that top edge and affixed thereto so as to form an upstanding lip, the water distribution trough having a plurality of spaced apart alignigly arranged water outlets formed therein, the improvement comprising,

an entrainment baffle means including an elongated deflector plate extending into the water distribution trough in spaced coextending relationship with the water outlets thereof for blocking water entrainment which would otherwise occur as a result of air movement into the water distribution trough through the water outlets formed therein, and including a mounting means integral with one of the longitudinal edges of said deflector plate and extending therefrom into attached engagement with the lip of the cooler pad assembly.

4,200,600

APPARATUS FOR HEATING A LIQUID SUSPENSION BY ANOTHER LIQUID SUSPENSION

Bertel Myréen, Turku, Finland, assignor to RA-Shipping Ltd. OY, Pargas, Finland

Filed Sep. 27, 1977, Ser. No. 837,703

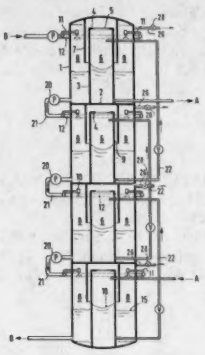
Claims priority, application Finland, Sep. 28, 1976, 2759/76

Int. Cl.[2] B01D *1/26;* F28B *1/00;* B01F *3/04*

U.S. Cl. 261—147 **6 Claims**

1. An apparatus for heating a first liquid by a second liquid without intermixing solid matters contained in said liquids, comprising a pressure vessel, partitions in said vessel dividing it into a plurality of pressure compartments, a container having a closed lower end and an open upper end disposed within each of said compartments with a free space surrounding said container, a baffle member having a closed upper end extending around each of said containers at a distance therefrom within said free space, said baffle member having a lower edge terminating at a lower level than said open upper end of said container, an inlet pipe and an outlet pipe respectively for said second liquid connected to each of said containers at the upper and lower portions thereof respectively, a plurality of injection nozzles for said first liquid disposed in the upper portion of each of said free spaces outside of said baffle members, and an outlet pipe for said first liquid connected to the lower portion of each of said free spaces, said free spaces and said containers

in said compartments being connected in series such that said outlet pipe for said second liquid of one container is connected to said inlet pipe for said second liquid of the container in the adjacent compartment, and said outlet pipe for said first liquid



of one of said free spaces being connected to said injection nozzles in said free space of the adjacent compartment, and means for supplying said first and second liquids to said injection nozzles and inlet pipes respectively in countercurrent flow with respect to each other.

4,200,601

PROCESS OF PREPARING FINELY DIVIDED POLYOLEFIN RESINS

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,645

Int. Cl.[2] B22D *23/08*

U.S. Cl. 264—9 **11 Claims**

1. A process for preparing in finely divided form a polyolefin resin which comprises:

(a) agitating a mixture of the resin while in the molten state, a dispersion-forming amount of water, and a dispersion-forming amount of an alkali metal salt of an amino acid dispersing agent, to provide a hot aqueous dispersion of the resin; and,

(b) cooling the dispersion to provide solid particles of resin.

4,200,602

METHOD FOR PRODUCING FILAMENTS OF HIGH TENACITY

James T. Gragson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 22, 1976, Ser. No. 752,933

Int. Cl.[2] B05B *3/00*; B29F *3/08*

U.S. Cl. 264—28 **4 Claims**

1. A method comprising extruding a molten polymer through at least one orifice to produce a filament and immediately cooling said filament to a temperature below its glass transition temperature by contacting said filament with a gas having a temperature ranging from about −20° C. to about 10° C., said polymer is the condensation product of 5-methyl-1,9-nonanediamine and terephthalic acid wherein the filament is heated and drawn at a temperature ranging from about 2° C. to about 40° C. below the glass transition temperature of the polymer.

4,200,603

PROCESS AND EQUIPMENT FOR THE CONTINUOUS PRODUCTION OF BLOCK-SHAPED FOAM

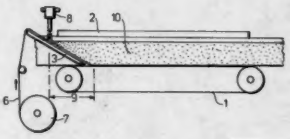
Reiner Raffel, Siegburg; Günter Hauptmann, Odenthal; Gerd Reffelmann, Overath, and Wilfried Ebeling, Cologne, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Hennecke GmbH, Leverkusen, Fed. Rep. of Germany

Filed Oct. 23, 1978, Ser. No. 954,048

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1977, 2748733

Int. Cl.[2] B29D *27/04*

U.S. Cl. 264—51 **7 Claims**



1. In a process for the continuous production of block-shaped foam wherein a liquid reaction mixture is applied to a moving bottom film upon which the mixture freely foams, the improvement wherein the bottom film is heated prior to the application of the reaction mixture, and wherein the heating is continued until the development of reaction heat from the reaction mixture.

4,200,604

METHOD FOR FORMING A SEALED OUTER RING FOR CERAMIC REGENERATOR

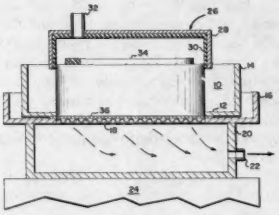
Chester J. Dziedzic, Dushore; Richard N. Kleiner, Towanda, and Joseph J. Cleveland, Wysox, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Division of Ser. No. 466,394, May 2, 1974, Pat. No. 3,938,923.

This application Sep. 17, 1975, Ser. No. 614,321

Int. Cl.[2] B28B *1/26*

U.S. Cl. 264—101 **2 Claims**



1. A method for simultaneously forming a gas-impervious seal of the peripheral cells and a high strength outer ring for a ceramic honeycomb structure, the structure comprising first and second opposing surfaces defining cell openings therein, and an outer wall, the method comprising:

(a) contacting the outer wall of the honeycomb structure with a castable ceramic composition,

(b) contacting a peripheral area of a first surface of the structure defining a predetermined number of peripheral cell openings, with a ceramic slurry composition,

(c) evacuating the cells whose openings are contacted with the slurry through corresponding openings in the opposing surface of the honeycomb structure, to promote flow of slurry into the evacuated cells, thereby to impregnate and seal these cells against gas flow,

(d) simultaneously vibrating the honeycomb structure to promote the flow and intimate contact of the castable composition with the outer wall of the regenerator struc-

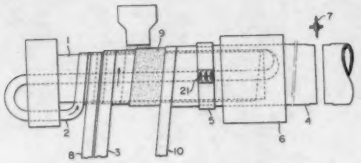
ture, thereby to form an outer adherent layer of green ceramic material on the wall of the structure.

4,200,605

PRODUCTION OF REINFORCED PLASTIC PIPES

Tetuo Imamura, Kusatsu; Minoru Yasuhara, Ohtsu, and Masaru Teramae, Shiga, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 29, 1977, Ser. No. 828,845
Claims priority, application Japan, Sep. 1, 1976, 51-105239
Int. Cl.[2] B28B *11/08, 11/14*
U.S. Cl. 264—145 **3 Claims**



1. A method for continuously producing a reinforced plastic pipe having a spigot end, said method comprising:

continuously helically winding an endless belt on an elongated rotating mandrel;

continuously helically winding molding material impregnated with a thermosetting resin on said endless belt, thereby forming a pipe structure of wound molding material;

continuously rotating said mandrel, and thereby continuously moving said endless belt and said pipe structure of wound molding material longitudinally of said mandrel toward an end thereof;

providing a split ring mold having an inner surface configuration corresponding to the desired outer surface configuration of a spigot end to be formed;

clamping said split ring mold around an axial length portion of said continuously longitudinally moving pipe structure of wound molding material, and pressing the inner surface of said split ring mold into said wound molding material, thereby forming the outer surface of said axial length portion of said pipe structure of wound molding material into said desired outer surface spigot end configuration;

thereafter continuously longitudinally moving said split ring mold with said longitudinally moving pipe structure of wound molding material, and passing said pipe structure and said split ring mold through a curing zone, thereby curing said thermosetting resin and forming a cured pipe structure;

after said cured pipe structure and said split ring mold are discharged from said curing zone, removing said split ring mold; and

thereafter severing said cured pipe structure at said axial length portion, to thereby provide a length of reinforced plastic pipe having a finished spigot end of said desired outer surface configuration and a desired outer diameter.

4,200,606

METHOD FOR SANITIZING TOILETS

David J. Kitko, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 22, 1978, Ser. No. 972,318
Int. Cl.[2] E03D *9/02, 9/03;* **A61L** *1/00*
U.S. Cl. 422—37 **5 Claims**

1. A method of treating a flush toilet which comprises a flush tank and a bowl, with a hypochlorite sanitizing agent each time the toilet is flushed, and providing a persistent color to the bowl water between flushes, said method comprising the step of dispensing from separate dispensing means, into the flush water;

A. an aqueous solution of a compound which produces hypochlorite ions in aqueous solution, and

B. a solution of a dye selected from the group consisting of FD&C blue No. 1 and FD&C Green No. 3;

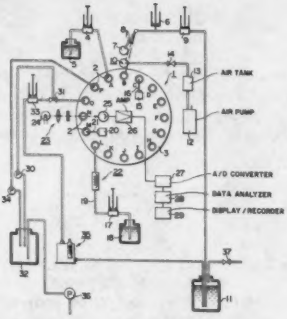
the amounts of Component A and Component B, respectively, being such as to produce a concentration of available chlorine of from about 2 ppm to about 10 ppm, a concentration of dye of from about 0.5 to about 5 ppm and a ratio of available chlorine to dye of from about 2:1 to 6:1 in the bowl water after the flush, the pH of the bowl water being from about 8 to about 9.5 after completion of the flush when the dye is FD&C Blue No. 1 and from about 8.5 to about 9.5 when the dye is FD&C Green No. 3.

4,200,607

AUTOMATIC CHEMICAL ANALYZER

Nobuyoshi Suzuki, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1978, Ser. No. 949,771
Claims priority, application Japan, Nov. 21, 1977, 52/139764
Int. Cl.[2] G01N *21/24, 1/14*
U.S. Cl. 422—64 **11 Claims**



1. An automatic chemical analyzer comprising:

a reaction tube conveying rotary disc having a plurality of reaction tube holders disposed at equal intervals along a circle thereof;

means for intermittently rotating said rotary disc in a single direction such that each of said reaction tube holders are sequentially stepped through a plurality of positions including a first reagent injection position, a sample injection position where a liquid sample to be examined is injected, a first agitating position, a second reagent injection position, a second agitating position, a reaction solution determining position, a reaction solution drain position and a reaction tube cleaning position;

each of said reaction tube holders depending from said rotary disc and having light passing openings formed in its sidewall;

a plurality of reaction tubes equal in number to the number of said reaction tube holders and formed of a transparent material, each of said reaction tubes being disposed in a respective said holder;

a thermostat liquid vessel having an annular configuration in plan view and disposed below said rotary disc in alignment with the reaction tube holders in such a manner that said holders are disposed in and move through a thermostat liquid located in said liquid vessel;

means for maintaining said thermostat liquid at a constant temperature;

an auxiliary heater embedded in the wall of said thermostat liquid vessel at said determining position and close to the location of a reaction tube located at said determining position;

openings formed in opposite walls of said thermostat liquid vessel at said determining position, said openings in said

wall of said vessel communicating with the openings formed in said holders;

a circulation pump for circulating said thermostat liquid through said vessel;

an optical measuring instrument including a light emitter and light receiving detector which are disposed on opposite sides of said openings formed in said vessel walls;

a first reagent injector for withdrawing a first reagent from a reagent container and injecting it into a reaction tube located at said first reagent injection position;

a sample liquid injector for withdrawing a sample liquid from a sample container and injecting it into a reaction tube located at said sample injection position;

a first agitator for agitating and mixing said first reagent and said sample liquid contained within a reaction tube located at said first agitating position;

a second reagent injector for withdrawing a second reagent from a reagent container and injecting it into a reaction tube located at said second reagent injection position through a reagent heater;

a second agitator for agitating and mixing said first reagent, said sample liquid and said second reagent which is contained in a reaction tube located at said second agitating position;

a drain pump for draining the reacted reaction solution from a reaction tube located at said reaction solution drain position into a drainage tank;

a rinse pump for injecting a heated rinse water into a reaction tube located at said drain position after said reaction solution has been drained therefrom, thus cleaning the interior of said tube; and

another drain pump for draining a rinse water from within a reaction tube located at said reaction tube cleaning position to a drainage tank.

4,200,608

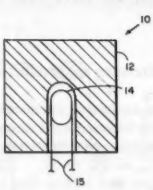
DETECTOR FOR FUMES OF HYDRAZINE AND ITS DERIVATIVES

Edgar F. Croomes, Athens, and James A. Murfree, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 915,706

Int. Cl.[2] G01N *27/02, 27/16, 31/10*

U.S. Cl. 422—97 **2 Claims**



1. A detector for fumes of hydrazine and its derivatives, methylhydrazine and 1,1-dimethylhydrazine comprising in combination:

(i) a pellet of aluminum oxide impregnated with the catalyst material iridium, said iridium comprising from about 28 to about 36 percent by weight of said pellet for catalytically decomposing said fumes when said fumes make contact with said iridium of said impregnated pellet to cause heat to be generated in said pellet;

(ii) thermally responsive thermistor means or thermocouple means embedded in said pellet responsive to said generated heat for providing an output signal proportional to said generated heat.

4,200,609

OZONE REMOVAL FILTER CONTAINING MANGANESE DIOXIDE AND CERIC OXIDE CATALYSTS

Norman R. Byrd, Villa Park, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Apr. 3, 1978, Ser. No. 892,975

Int. Cl.[2] B01J *23/34, 23/84;* **C01B** *13/08*

U.S. Cl. 422—122 **20 Claims**

1. A device effective particularly for removing ozone from air, comprising a substrate containing a coating of manganese dioxide and ceric oxide, deposited from a permanganate solution containing a soluble ceric salt.

4,200,610

GAS-PRODUCING DEVICE

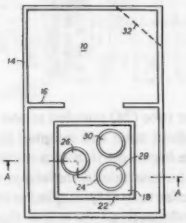
Derwent Swaine, Basingstoke, England; Henry K. Spong, Santos, Brazil, and Brian M. Lewin, Basingstoke, England, assignors to Oxoid Limited, Basingstoke, England

Filed Jan. 9, 1978, Ser. No. 868,059

Claims priority, application United Kingdom, Jan. 11, 1977, 967/77

Int. Cl.[2] B01J *7/02*

U.S. Cl. 422—239 **7 Claims**



1. A hydrogen and carbon dioxide gas generating means for generating a hydrogen and carbon dioxide environment for use in culturing anaerobic microorganisms comprising a closed envelope means formed from an inert material with a frangible inlet means at one end thereof, said inlet being rupturable to afford the ingress of a liquid reactant; said envelope further having a sachet means therein forming a closed container for holding gas generating material, means in said envelope means for maintaining said sachet means in the lower half thereof, said sachet means having a wall portion thereof being formed of a gas-liquid permeable membrane adapted to permit an air flow rate therethrough of from 100 to 1000 cubic feet of air per square foot per minute; and gas generating material disposed within the sachet means adjacent to the membrane for reacting with a liquid reactant to generate the desired hydrogen and carbon dioxide atmosphere; the arrangement affording a two-way flow path transversely through the membrane, both for liquid into the sachet means and for gas from the sachet means, whereby in use the rate of ingress of liquid into the sachet means is determined in part by the surface area and permeability of the membrane and in part by the gas pressure within the sachet means.

4,200,611

DISTRIBUTION DEVICE

William W. Gorman, Jr., and Esther M. Gorman, both of Treasure Island, Fla., assignors to E-C Apparatus Corporation, St. Petersburg, Fla.

Filed Jun. 26, 1978, Ser. No. 919,099

Int. Cl.[2] B01D *11/00*

U.S. Cl. 422—258 **3 Claims**

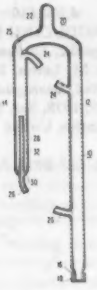
1. A tube element adapted for interconnection in a rotatable array of such elements to implement the mixing and separating of two at least semi-immiscible liquids, comprising:

(a) an elongated hollow mixing tube (12) closed at a lower end,

(b) an elongated hollow decanting tube (14) shorter than the mixing tube and disposed spaced from but parallel thereto with the upper ends of both tubes at substantially the same level,

(c) a fluid communicating juncture tube (20) coupling the open upper ends of the mixing and decanting tubes,

(d) an elongated downspout tube (28) sealingly mounted in the lower end (30) of the decanting tube and extending upwardly therein a predetermined distance for defining the volume of a lower phase,



(e) a first transfer tube (26) coupled at one end to a lower end of the downspout tube and adapted to be coupled at its other end to a lower portion of a mixing tube of an adjacent element on one side in the array, and

(f) a second transfer tube (24) coupled at one end to an upper portion of the decanting tube below the juncture tube and above the level of the downspout tube and having a lip (25) above the juncture between the second transfer tube and decanting tube and below the juncture tube and adapted to be coupled at its other end to an upper portion of a mixing tube of an adjacent element of another, opposite side in the array.

4,200,612

PROCESS FOR RECOVERING ACIDS AND ZIRCONIUM CONTAINED IN PICKLING SOLUTIONS

Airy P. Lamaze, Ugine, France, assignor to Ugine Aciers, Paris, France

Filed Nov. 7, 1978, Ser. No. 958,491
Claims priority, application France, Nov. 29, 1977, 77 36627
Int. Cl.[2] C01G *25/00*
U.S. Cl. 423—70 **8 Claims**

1. A process for recovering zirconium values from a pickling solution containing fluoride and nitrate ions, comprising the steps of:

preparing an anionic ion exchange resin in a column with a sulfuric acid solution in order to saturate the resin with sulfate ions;

contacting the resin thus prepared with a used pickling solution containing zirconium in a concentration of less than 50 grams per liter of solution and also containing fluoride and nitrate ions, the zirconium being absorbed by the resin; and,

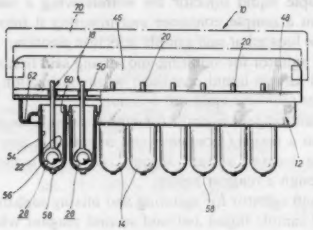
passing a hydrochloric acid solution through the column to replace the used pickling solution containing fluoride and nitrate ions and, on volumetric displacement of the used pickling solution, continuing to pass the hydrochloric acid solution through the column to elute zirconium from the column in a sulfate solution separately from the replaced used pickling solution.

4,200,613

RADIOIMMUNOASSAY APPARATUS

Clarence P. Alfrey, Houston, and Donald B. Bedford, New Braunfels, both of Tex., assignors to Ramco Laboratories Inc., Houston, Tex.

Continuation of Ser. No. 803,366, Jun. 3, 1977, abandoned. This application Apr. 14, 1978, Ser. No. 896,176
Int. Cl.[2] G01N *33/16*
U.S. Cl. 422—71 **15 Claims**



1. Apparatus for performing a quantitative radioimmunoassay comprising:

a bead for carrying a dry antibody;

a gripper for gripping said bead, said gripper comprising an elongate handle portion, and a clasp portion;

a carrier for carrying said gripper, said carrier comprising a base portion

a plurality of spaced apart collars carried by said base portion and for receiving therethrough said elongate handle portion; and

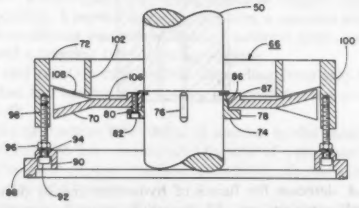
a reaction chamber for receiving said bead when said bead is gripped by said gripper and having support means to support said carrier when said gripper is carried by said carrier.

4,200,614

TURBINE MIXER

Samuel E. Colburn, Middletown, and James W. Mauck, West Chester, both of Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Feb. 17, 1978, Ser. No. 878,623
Int. Cl.[2] B01J *1/00, 3/04*
U.S. Cl. 422—134 **10 Claims**



1. In a chemical reactor including a reactor chamber for producing a desired chemical reaction of materials therein as the chemicals flow generally from an upstream portion of the reactor to a downstream portion of the reactor, a turbine mixer for providing intense mixing of the chemical materials, comprising:

(a) a rotatably mounted shaft positioned within said reactor chamber;

(b) a rotor assembly having a plurality of radially extending turbine blades mounted on said shaft for rotation there-

with, said turbine blades extending radially outwardly into proximity with the inner wall surface of said reactor chamber, each said turbine rotor blade having a curvilinear surface with a first inner radial section radially extending from said rotatably mounted shaft and having a major surface area in a first plane and a second outer radial section radially extending from the first inner section and having a major surface area in second plane, and the plane of a major surface area of said outer radial section being angled with respect to the plane of the major surface area of the inner radial section so as to impart a generally curvilinear surface contour to each said rotor blade; and

(c) a stator assembly stationarily mounted within said reactor chamber adjacent to and directly upstream of said rotor assembly, said stator assembly comprising,

(i) an outer cylindrical frame member positioned adjacent the inner wall surface of said reactor chamber and extending coaxially and concentrically with said rotatably mounted shaft,

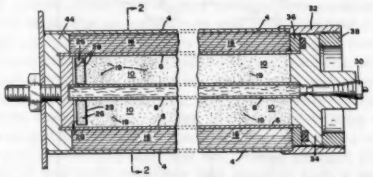
(ii) a plurality of substantially radially extending stator vanes extending between and being fastened to said inner and outer cylindrical frame members and mounted adjacent to the outer radial sections of said turbine blades, and the plane of the major surface area of each stator vane extending substantially parallel to the axis of rotation of said shaft, whereby relative rotation between the rotor and stator assemblies produces intense mixing of the materials within the chemical reactor chamber.

4,200,615

ALL-PYROTECHNIC INFLATOR

Brian K. Hamilton; Eugene F. Garner, and Terry R. Harrell, all of Saugus, Calif., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 671,658, Mar. 29, 1976, abandoned.
This application Apr. 28, 1977, Ser. No. 791,745
Int. Cl.[2] B01J *7/00;* **B60R** *21/02*
U.S. Cl. 422—166 **10 Claims**



1. An all-pyrotechnic inflator for generating an inflating gas comprising:

an elongated enclosure means having an inner wall, an outer wall, an annular space between said walls, a longitudinal axis and an outlet means in said outer wall for passage of said gas;

a linear ignitor arranged within said enclosure means and extending along substantially the entire length of said longitudinal axis of said enclosure means;

a pyrotechnic material disposed within said enclosure means and extending substantially around said linear ignitor for combustion and generation of said gas upon ignition by said ignitor, said pyrotechnic material being the sole source of said inflating gas;

a nozzle means arranged in said inner wall for passage of said gas to said annular space, said gas passing through said outer wall and said outlet means, said nozzle means comprising a plurality of apertures along at least a part of the longitudinal extent of said inner wall; and

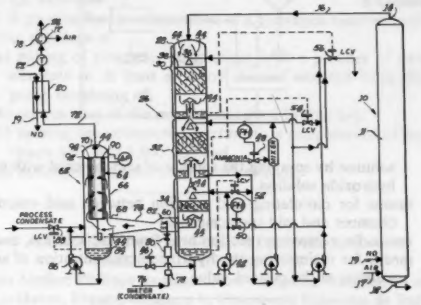
means for maintaining substantially constant pressure during generation of said gas, said substantially constant pressure means comprising a plurality of burst plates, one burst plate adjacent to each aperture in said inner wall, each burst plate having an area larger than the area of said adjacent aperture, each burst plate disposed inside of said inner wall and covering said adjacent aperture prior to ignition of said pyrotechnic material, said burst plates being designed so as to burst at different pressures.

4,200,616

AMMONIUM NITRATE PARTICLE REMOVAL APPARATUS

Richard W. Johansen, Fremont, Nebr., assignor to CF Industries, Inc., Long Grove, Ill.

Filed Apr. 17, 1978, Ser. No. 896,993
Int. Cl.[2] B01J *10/00, 1/00;* **B01D** *47/06;* **C01C** *1/18*
U.S. Cl. 422—169 **6 Claims**



1. In a nitric acid production plant including a heat exchanger and downstream power recovery turbine which is fed by the flow of off gas of the nitric acid production process to drive a compressor for providing compressed air to the plant, and a nitrogen oxides abatement system interposed in the off gas stream ahead of said heat exchanger, the improvement comprising apparatus for removing solid ammonium nitrate particulate matter produced by said abatement system and carried in the flow of off gas of said abatement system, so as to prevent particle build up and plugging in said heat exchanger, said apparatus comprising: filter means including a housing having inlet means and outlet means and a vertically packed fiber bed carried between a pair of tubular screens disposed substantially vertically in said housing generally between said inlet means and said outlet means, conduit means including a venturi for delivering said flow of off gas from said nitrogen oxide abatement system to said inlet means, fog nozzle means in said venturi for distributing a water mist substantially uniformly into said gas flow to cause said ammonium nitrate particulate matter to go into aqueous solution so as to be trapped in said fiber bed and to irrigate said fiber bed to cause said solution to gradually flow from said fiber bed to said housing to be recovered as desired.

4,200,617

PRODUCT RECOVERY FROM ALKALI METAL WASTES

Donald J. Levy, Mountain View, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Nov. 9, 1977, Ser. No. 849,975
Int. Cl.[2] C06B *21/00*
U.S. Cl. 422—198 **2 Claims**

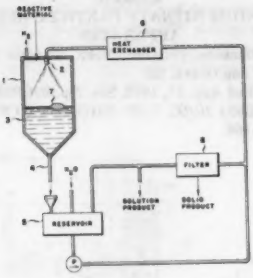
1. An apparatus for converting at least one reactive material selected from the group consisting of sodium sludge and materials containing sodium, lithium or potassium metal into its respective metal hydroxide comprising

a reaction chamber partially filled with a solution of the hydroxide of said material the remaining portion of said chamber containing an essentially oxygen-free atmosphere above said solution,

means for introducing said reactive material into said reac-

tion chamber, with the material so introduced floating on said hydroxide solution and being contacted on its topside by said atmosphere,

spray means contained in the portion of said reaction chamber containing said oxygen-free atmosphere, said spray means cooling the topside of said material floating on said



solution by spraying the topside of said material with said hydroxide solution,

means for circulating said solution between said reaction chamber and said spray means,

means for removing reaction heat from said solution, and

means for maintaining the hydroxide concentration of said solution at the desired value.

4,200,618

PREPARATION OF MAGNESIUM CHLORIDE

Frank Pitts, Magalas, France, assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Feb. 28, 1979, Ser. No. 15,768

Int. Cl.[2] C01F *5/30*

U.S. Cl. 423—163 **11 Claims**

1. A process for the manufacture of magnesium chloride which comprises (a) providing waste acidic chloride residues produced in the manufacture of titanium tetrachloride by the chloride process, (b) forming said waste chlorides into an aqueous slurry by adding water thereto, (c) gradually adding to said slurry a magnesium-containing material selected from the group consisting of magnesium oxide, magnesium hydroxide, magnesium carbonate, calcined breunnerite and mixtures thereof until the pH of the slurry is at least 5.5, (d) separating insoluble matter from the resulting aqueous solution of magnesium chloride and (e) recovering said solution of magnesium chloride.

4,200,619

PROCESS FOR PURGING SODIUM SULFATE FROM A SULFUR DIOXIDE REMOVAL SYSTEM

Edgar E. Bailey, Lakeland, Fla.; Norman E. Nicholson, Stockton-on-Tees, England; John Scarlett, Kirk Merrington, England, and John F. Flintoff, Middlesbrough, England, assignors to Davy Powergas, Inc., Lakeland, Fla.

Continuation of Ser. No. 647,516, Jan. 8, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,227

Int. Cl.[2] C01B *17/00;* **C01D** *5/00;* **C01B** *17/45*

U.S. Cl. 423—242 **13 Claims**

1. In a process for the removal of sulfur dioxide from gas in which sulfur dioxide is absorbed from the gas in an aqueous absorption solution of sodium sulfite to from the corresponding bisulfite, resulting bisulfite-containing absorption solution is desorbed to form sulfur dioxide and crystallize sodium sulfite from solution, and a sulfite-containing absorption solution is regenerated for recycling by dissolving crystallized sodium sulfite, and in which sodium sulfate is formed in the absorption-desorption medium, the improvement for removing sulfate from the system comprising contacting at a temperature of at least about 37° C., a portion of the aqueous absorption-desorption medium having in solution a major amount of sodium bisulfite, a minor amount of sodium sulfate, and a minor amount of sodium sulfite, based on the total weight of these components, with a sulfur dioxide-containing treating gas which is unsaturated with respect to water to remove sufficient water from the absorption-desorption medium to precipitate at a temperature of at least about 37° C., up to about 20 weight percent solids derived from the absorption-desorption medium, said solids having a major amount of sulfate and a minor amount of sulfite, without converting a substantial amount of bisulfite in solution to sulfite, separating sulfate and sulfite-containing precipitate and bisulfate-containing solution from resulting slurry, said precipitate having an increased amount of sodium sulfate based on the total weight of sodium sulfate, sodium sulfite and sodium bisulfite in said solids than in said absorption-desorption medium, removing sulfate and sulfite-containing precipitate as purge from the system, and passing said separated solution to the absorption-desorption cycle.

4,200,620

DECONTAMINATION OF WET-PROCESSED PHOSPHORIC ACID

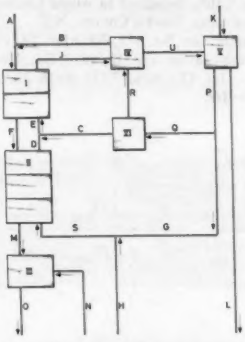
Klaus-Peter Ehlers, Erftstadt; Wolfgang Scheibitz, Hürth-Knapsack; Klaus Schrödter, Cologne, and Gero Heymer, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 12, 1977, Ser. No. 859,879

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657190

Int. Cl.[2] C01B *25/16*

U.S. Cl. 423—321 S **16 Claims**



1. In the process for purifying wet-processed phosphoric acid, wherein the phosphoric acid to be decontaminated is extracted countercurrently with an organic solvent which is partially miscible with water and capable of absorbing phosphoric acid, the resulting organic phosphoric acid solution, termed extract, is separated from contaminants unabsorbed by the solvent, termed raffinate; the decontaminated phosphoric acid is recovered from the solvent either in the form of free acid by reextracting the organic phosphoric acid solution with water, or in the form of an alkali metal phosphate by reacting the organic phosphoric acid solution with an alkali, the remaining organic solvent is recycled to the process and the said raffinate is treated countercurrently with a solvent containing a mineral acid, the improvement which comprises:

(a) carrying out the extraction in two extraction zones I and II separated from one another, wherein in zone I a primary extract and a primary raffinate and in zone II a secondary extract and a secondary raffinate is formed,

(b) dividing the recycled organic solvent containing water in a first and a second portion,

(c) after dehydrating mixing the first solvent portion and the

secondary extract originating from extraction zone II containing phosphoric acid and more than 0 up to at most 10 weight % of water, both in a ratio by weight necessary to ensure the formation of a mixture containing more than 0 and less than 50% of water that would correspond to the saturation concentration of water in the solvent; and in a quantity sufficient to absorb all of the liquid phosphoric acid contained in the crude phosphoric acid which is to be decontaminated, and all of the umcombined water present in the said wet-processed phosphoric acid,

(d) contacting countercurrently within the extraction zone I the mixture obtained in step (c) and the said crude phosphoric acid with the resultant formation of the said primary extract and the primary raffinate,

(e) forming the secondary extract and the secondary raffinate by delivering the primary raffinate into the extraction zone II, there contacting the primary raffinate countercurrently with a mixture consisting of a mineral acid and the second portion of the solvent containing water, said mixture containing the mineral acid in a quantity necessary to provide 1 acid equivalent per 1 g atom of phosphorous, contained in the primary raffinate, and removing the remaining secondary raffinate from the extraction zone II, and

(f) recovering the purified phosphoric acid from the primary extract.

4,200,621

SEQUENTIAL PURIFICATION AND CRYSTAL GROWTH

H. Ming Liaw, and Charles J. Varker, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 18, 1978, Ser. No. 925,733

Int. Cl.² C01B *33/02*

U.S. Cl. 423—348 **14 Claims**

1. A process for the sequential purification and crystal growth of silicon crystals from impure silicon which comprises the steps of: melting said impure silicon in a crucible to form a melt; removing insoluble impurities from said melt by rotating said crucible and said melt and directing a gas flow onto a wall of said crucible, said rotating and said gas flow causing said insoluble impurities to coalesce on said melt, inserting a seed through said insoluble impurities to contact said melt, freezing a portion of said melt to said seed to trap said insoluble impurities, and withdrawing said seed, frozen melt and insoluble impurities; reacting a gas with said melt to remove soluble impurities from said melt; adding an oxide-slag forming compound to said melt to further remove soluble impurities; inserting a seed crystal into said melt and pulling an ingot from a portion of said melt; remelting said ingot to form a second melt; inserting a seed into said second melt and pulling a crystal therefrom.

4,200,622

PURIFICATION OF AMMONIUM FLUORIDE SOLUTIONS

Hans Kyri; Hans-Dietrich Lauss, and Siegfried Schneider, all of Cologne, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,329

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1977, 2750943

Int. Cl.² C01C *1/16*

U.S. Cl. 423—471 **5 Claims**

1. A process for the purification of a commercial ammonium fluoride solution by removal of silicic acid and iron ions therefrom which comprises the steps of:

(i) adding, at a temperature of below 30° C., an iron (III) salt to said commercial ammonium fluoride solution having a concentration of free ammonia in solution of greater than 1% by weight and a pH of more than 8.5;

(ii) adding one or more of the dissolved salts of the ions of the alkali metals, alkali earth metals, zinc, aluminum or lead in such quantities that the solution becomes saturated with at least one of said ions; and

(iii) removing the precipitated iron (III) salts and the silicic acid carried therewith.

4,200,623

PROCESS FOR THE PREPARATION OF A HYDROGEN RESERVE

Alain Muller; Philippe Engelhard, and Joseph E. Weisang, all of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Oct. 25, 1978, Ser. No. 954,648

Claims priority, application France, Oct. 27, 1977, 77 32499

Int. Cl.² C01B *6/24*

U.S. Cl. 423—644 **9 Claims**

1. A process for the preparation of a hydrogen reserve comprising the steps of

(a) mixing of powdered magnesium with a powder of two elements or at least an alloy thereof selected from the group consisting of;

(b) compacting of the mixture obtained in step (a);

(c) heating the compacted mixture to a temperature of between 400° and 1,600° C.; and

(d) hydrogenating the compacted mixture.

4,200,624

COMBINED HYDROGEN STORAGE AND PRODUCTION PROCESS

Alain Muller; Philippe Engelhard, and Joseph E. Weisang, all of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Oct. 25, 1978, Ser. No. 954,649

Claims priority, application France, Oct. 27, 1977, 77 32498

Int. Cl.² C01B *6/24*

U.S. Cl. 423—644 **10 Claims**

1. In a combined process for the storage and production of hydrogen from a magnesium-containing hydrogen reserve by storing the hydrogen in the reserve by hydrogenation thereof, decomposing the reserve to produce hydrogen, and reconstituting the reserve by hydrogenation; the improvement comprising incorporating in said reserve from 1 to 99.9 wt. % of magnesium and a dope selected from the group consisting of titanium-nickel, and titanium-molybdenum.

4,200,625

IMMOBILIZED BINDER FOR AUTOMATED ASSAY

Max G. Reese, Salt Lake City, Utah, assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Jul. 12, 1978, Ser. No. 923,711

Int. Cl.² G01N *33/16;* A61K *43/00;* B01J *1/22;* G21H *5/02*

U.S. Cl. 424—1 **11 Claims**

1. In an assay wherein a ligand to be assayed and labeled form of the ligand are caused to flow through a chamber having a binder specific for the ligand supported on a solid substrate, and wherein the binder is regenerated for reuse in the assay by releasing ligand and labeled ligand from the binder, the improvement comprising:

employing fibrous cotton as said solid substrate.

4,200,626

HALOPLATINATE DENTAL COMPOSITION FOR PREVENTING AND INHIBITING DENTAL CARIES

Hirohisa Okuda, Nara, and Nobutaka Hori, Uji, both of Japan, assignors to Toyo Seiyaku Kasei Co., Ltd., Japan

Filed Sep. 15, 1978, Ser. No. 942,809

Int. Cl.² A61K *7/16, 33/24*

U.S. Cl. 424—51 **11 Claims**

1. A dental composition for preventing and inhibiting dental caries which comprises not less than 0.01% by weight (as platinum) of a water-soluble hexahaloplatinate or tetrahaloplatinate and an acceptable dental carrier or diluent.

4,200,627
ATOXIC, IMMUNOGENIC PRODUCT OF TETANUS TOXIN

Torsten B. Helting, Marburg an der Lahn, Fed. Rep. of Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Fed. Rep. of Germany

Continuation of Ser. No. 819,939, Jul. 28, 1977. This application Dec. 21, 1978, Ser. No. 971,848

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634584

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.[2] A61K *39/08*

U.S. Cl. 424—92 **4 Claims**

1. An atoxic immunogenic product from tetanus toxin prepared by cleaving tetanus toxin by treating it with a peptide-peptidohydrolase at a pH between 5 and 10 so not to cause the irreversible denaturization of the protein body of tetanus toxin and then isolating from the reaction mixture said product, having

(a) a sedimentation constant of S^{o}_{20w} 5.66±0.34,

(b) an immunologic reaction with tetanus antitoxin partially identical with that of tetanus toxin,

(c) an immunologic reaction not identical with that of fragment C of tetanus toxin,

(d) a molecular weight of 95,000±5,000 as determined by gel electrophoresis in sodium dodecylsulfate, and

(e) an ability to be cleaved into a sub-unit having a molecular weight of 45,000±2,500 and a sub-unit having a molecular weight of 48,000±2,500, as determined by gel electrophoresis in sodium dodecylsulfate, said latter sub-unit being immunologically identical with the known derivative of the light chain of tetanus toxin.

4,200,628
NOVEL AMINOGLYCOSIDE DERIVATIVES

Kikuo Igarashi, Itami; Junji Irisawa, Nishinomiya, and Tsunetoshi Honma, Ikoma, all of Japan, assignors to Shionogi & Co., Ltd., Dosho, Japan

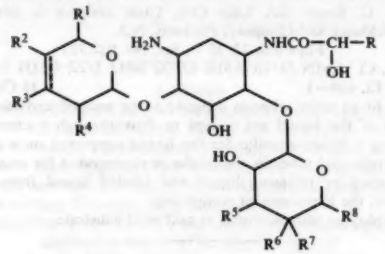
Filed Sep. 19, 1978, Ser. No. 944,065

Claims priority, application Japan, Oct. 25, 1977, 52-128447

Int. Cl.[2] A61K *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **19 Claims**

1. A novel aminoglycoside derivative represented by the formula:



wherein

R is a member of the group consisting of 2-azetidinyl, 3-azetidinyl, 2-pyrrolyl, 3-pyrrolyl, 2-pyrrolinyl, 3-pyrrolinyl, 2-pyrrolidinyl, 3-pyrrolidinyl, 2-imidazolyl, 4-imidazolyl, 2-imidazolinyl, 4-imidazolinyl, 2-imidazolidinyl, 4-imidazolidinyl, 3-pyrazolyl, 4-pyrazolyl, 3-pyrazolinyl, 4-pyrazolinyl, 3-pyrazolidinyl, 4-pyrazolidinyl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-piperidyl, 3-piperidyl, 4-piperidyl, 3-pyridazinyl, 4-pyridazinyl, 2-pyrimidinyl, 4-pyrimidinyl, 5-pyrimidinyl, 2-pyrazinyl, 3-pyrazinyl, 2-piperazinyl, and 3-piperazinyl;

R^1 is aminomethyl, hydroxymethyl, 1-aminoethyl, or 1-methylaminoethyl;

R^2, R^3 and R^6 each is hydrogen or hydroxy;

R^4 is hydroxy or amino;

R^5 is amino or methylamino;

R^7 is hydroxy or methyl;

R^8 is hydrogen, hydroxymethyl, or carbamoyloxy-methyl; and

the dotted line represents the presence of absence of a double bond

and a pharmaceutically acceptable salt thereof.

19. A method for treating bacterial infectious diseases of humans or other species of animals which comprises administering to a host suffering from such bacterial infectious disease a bactericidally effective amount of a compound claimed in any of above claims 1 to 17.

4,200,629
ANTI-FUNGAL SUBSTANCE AND PREPARING METHOD THEREOF

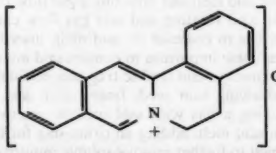
Junichi Nakamura, Minamiichijonishi-13-chome, Chuo-ku, Sapporo-shi, Japan

Continuation of Ser. No. 635,310, Nov. 26, 1975, abandoned. This application Dec. 19, 1977, Ser. No. 862,036

Int. Cl.[2] A01N *9/08;* **A61K** *35/78*

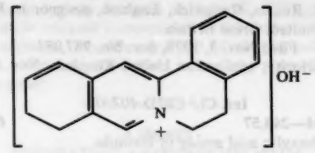
U.S. Cl. 424—195 **21 Claims**

1. A process for preparing a composition for treating fungous diseases derived from pathogenic fungi comprising the steps of treating plant tissue containing a berberine type alkaloid having the skeletal structure



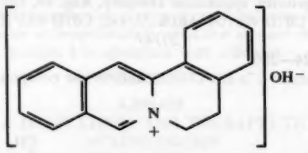
the plant tissue being that of plants selected from the group consisting of *Phellodendron amurense* Ruprecht; *P. amurense* Rupr. var. sachalinense; *P. amurense* Rupr. Var. japonicum (Maxim.) Ohwi; *P. amurense* Rupr. var. Levallei (Dode) Sprague; *Coptis japonica* Makino; *Coptis japonica* Makino var. dissecta Nakoi; *Coptis trifolia salisbuty; Exanphorrhiza; Xanphorrhiza simplicissima; Berberis Thunberzii, Berberis sieboldi; Berberis amurensis; Nandina domestica; Costinum fenestratum, Columbo Radix* and mixtures thereof with a non-polar solvent to prepare plant tissue free from fatty or resinous materials; extracting the plant tissue free from fatty or resinous materials with a polar solvent until a substantially colorless extract solution is obtained; combining the extract solution with an aqueous caustic alkali dihydrogenphosphate solution; heating the resultant mixture at a temperature of 35°–75° C.; concentrating the extract solution by evaporating off the polar organic solvent under reduced pressure; mixture the resulting concentrated solution with an amount of an aqueous dicaustic alkali hydrogenphosphate solution to adjust the pH of the mixture to 6.8–7.2; and drying the mixture under reduced pressure or freeze drying it to obtain a solid product.

2. A process for preparing a composition for treating fungous diseases derived from pathogenic fungi comprising the steps of treating plant tissue containing a berberine type alkaloid having the skeletal structure



the plant tissue being that of plants selected from the group consisting of *Phellodendron amurense* Ruprecht; *P. amurense* Rupr. var. sachalinense; *P. amurense* Rupr. var. japonicum (Maxim.) Ohwi; *P. amurense* Rupr. var. Levallei (Dode) Sprague; *Coptis japonica* Makino; *Coptis japonica* Makino var. *dissecta Nakoi; Coptis trifolia salisbuty; Exanphorrhiza; Xanphorrhiza simplicissima; Berberis Thunberzii; Berberis sieboldi; Berberis amurensis; Nandina domestica; Costinum fenestratum, Columbo Radix* and mixtures thereof with a non-polar solvent to prepare plant tissue free from fatty or resinous materials; extracting the plant tissue free from fatty or resinous materials with a mixture of a polar organic solvent and an aqueous caustic alkali dihydrogenphosphate solution until a substantially colorless extract solution is obtained; heating the resultant mixture at a temperature of 35°–75° C.; concentrating the extract solution by evaporating off the polar organic solvent under reduced pressure; mixing the resulting concentrated solution with an amount of an aqueous dicaustic alkali hydrogenphosphate solution to adjust the pH of the mixture to 6.8–7.2; and drying the mixture under reduced pressure or freeze drying it to obtain a solid product.

17. A composition for treating fungous diseases derived from pathogenic fungi and prepared by a process comprising the steps of treating plant tissue containing a berberine type alkaloid having the skeletal structure



the plant tissue being that of plants selected from the group consisting *Phellodendron amurense* Ruprecht; *P. amurense* Rupr. var. sachalinense; *P. amurense* Rupr. var. japonicum (Maxim.) Ohwi; *P. amurense* Rupr. Var. Levallei (Dode) Sprague; *Coptis japonica* Makino; *Coptis japonica* Makino var. dissecta Nakoi; *Coptis trifolia salisbuty; Exanphorrhiza; Xanphorrhiza simplicissima; Berberis Thunberzii, Berberis sieboldi; Berberis amurensis; Nandina domestica; Costinum fenestratum, Columbo Radix* and mixtures thereof with a non-polar solvent to prepare plant tissue free from fatty or resinous materials; extracting the plant tissue free from fatty or resinous materials with a mixture of a polar organic solvent and an aqueous caustic alkali dihydrogenphosphate solution until a substantially colorless extract solution is obtained; heating the resultant mixture at a temperature of 35°–75° C.; concentrating the extract solution by evaporating off the polar organic solvent under reduced pressure; mixing the resulting concentrated solution with an amount of an aqueous dicaustic alkali hydrogenphosphate solution to adjust the pH of the mixture to 6.8–7.2; and drying the mixture under reduced pressure or freeze drying it to obtain a solid product.

20. A process for preparing a true-fungi controlling composition comprising the steps of extracting a member selected from the group consisting of Phellodendron powder and Coptis powder with a polar organic solvent until a substantially colorless extract solution is obtained; combining the extract solution with an aqueous caustic alkali dihydrogenphosphate solution; heating the resultant mixture at a temperature of 35°–75° C.; concentrating the extract solution by evaporating off the polar organic solvent under reduced pressure; mixing the resulting concentrated solution with an amount of an aqueous dicaustic alkali hydrogenphosphate solution to adjust the pH of the mixture to 6.8–7.2; and drying the mixture under reduced pressure or freeze drying it to obtain a solid product.

4,200,630

INHIBITION OF ADH-STIMULATED OSMOTIC WATER FLOW AND ALDOSTERONE-STIMULATED SODIUM TRANSPORT

Malcolm Cox, and Irwin Singer, both of Philadelphia, Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 860,837, Dec. 15, 1977, Pat. No. 4,154,827.
This application Dec. 1, 1978, Ser. No. 965,478
Int. Cl.[2] A61K *31/65*
U.S. Cl. 424—227 **2 Claims**

1. A method for the inhibition of aldosterone-stimulated sodium transort in a mammal in need of such treatment, comprising treating the mammal with an effective amount of anhydro-7-chloro-6-demethyltetracyline as the inhibitor.

4,200,631

TREATING MAMMALIAN SUBJECT SENSITIVE TO INDOMETHACIN ULCEROGENISIS

Elemer Ezer; Laszlo Szporny; Lilla Forgach; Eva Palosi; Eszter Cholnoky; Egon Karpati; György Hajös; Győző Hortobagyi, and Katalin Gidai, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation-in-part of Ser. No. 641,771, Dec. 17, 1975, abandoned. This application Aug. 8, 1978, Ser. No. 931,910
Int. Cl.[2] A61K *31/62, 31/405*
U.S. Cl. 424—232 **11 Claims**

1. A method of attenuating the ulcerogenic effect of indomethacin upon an ulcer-prone subject which comprises orally administering the indomethacin, in a pharmaceutically effective amount, in combination with 7.5 to 25 parts by weight of salicylic acid or an alkali salicylate calculated for one part by weight of the indomethacin.

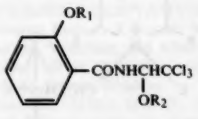
4,200,632

2-HYDROXY BENZAMIDE DERIVATIVES AND USE THEREOF AS FUNGICIDES

Taizo Nakagawa, Ageo; Kaoru Ohmori, Okegawa; Seiji Mochizuki, Ageo; Eiichi Tanaka, Ageo, and Osamu Yamada, Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

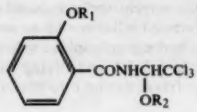
Filed Aug. 30, 1978, Ser. No. 938,248
Claims priority, application Japan, Sep. 1, 1977, 52/104226
Int. Cl.[2] A01N *9/24;* **C07C** *103/19*
U.S. Cl. 424—230 **20 Claims**

1. A compound represented by the formula:



wherein R_1 is hydrogen or alkyl-carbonyl wherein the alkyl has 1 to 6 carbon atoms and R_2 is alkyl having 1 to 18 carbon atoms or phenyl.

6. A fungicidal composition for agriculture comprising 0.5 to 95% by weight of a compound of the formula:



wherein R_1 is hydrogen or alkylcarbonyl wherein the alkyl has 1 to 6 carbon atoms, R_2 is alkyl having 1 to 18 carbon atoms or phenyl and 99.5 to 5% (by weight) of adjuvants.

4,200,633

THIOETHER CONTAINING QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES AS MICROBIOCIDES

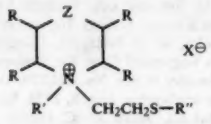
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 886,182, Mar. 13, 1978, Pat. No. 4,146,709. This application Dec. 4, 1978, Ser. No. 966,221

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A process for inhibiting microbiological growth in water which comprises treating said water with a compound characterized by the formula



where R is hydrogen or a hydrocarbon group, R′ is a hydrocarbon group, R″ is a hydrocarbon group, Z is S, SO or SO_2 and X is an anion.

4,200,634

SULFONE CONTAINING QUATERNARY AMMONIUM DERIVATIVES OF 1,4-THIAZINES AS MICROBIOCIDES

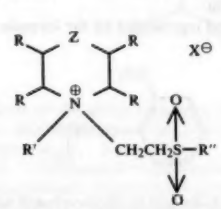
Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 886,183, Mar. 13, 1978, Pat. No. 4,146,711. This application Dec. 4, 1978, Ser. No. 966,222

Int. Cl.[2] A01N *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A process for inhibiting microbiological growth in water which comprises treating said water with a compound characterized by the formula



where R is hydrogen or a hydrocarbon group, R′ is a hydrocarbon group, R″ is a hydrocarbon group, Z is S, SO or SO_2 and X is an anion.

4,200,635

ANTIBACTERIALLY ACTIVE AMIDES

Norman H. Rogers, Rudgwick, England, assignor to Beecham Group Limited, Great Britain

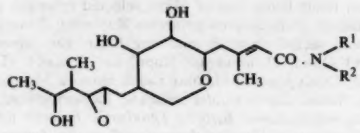
Filed Nov. 3, 1978, Ser. No. 957,054

Claims priority, application United Kingdom, Nov. 5, 1977, 46120/77

Int. Cl.[2] C07D *407/06*

U.S. Cl. 424—248.57 **6 Claims**

1. A carboxylic acid amide of formula:



wherein R^1 is hydrogen or alkyl of 1 to 6 carbon atoms and R^2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 8 carbon atoms, or $-(CH_2)_nCOOR^3$ wherein n is an integer from 1 to 20 and R^3 is hydrogen or a pharmaceutically acceptable salt-forming ion or alkyl of 1 to 6 carbon atoms or R^1 and R^2, together with the nitrogen atom to which they are attached, are pyrrolidinyl, piperidinyl or morpholino.

4,200,636

3-AMINO-17A-AZA-D-HOMOANDROSTANE COMPOUNDS, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Zoltan Tuba; Maria Marsai; Sandor Gorog; Katalin Biro; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

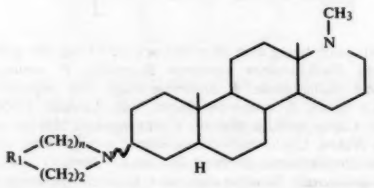
Filed Aug. 17, 1978, Ser. No. 934,799

Claims priority, application Hungary, Aug. 18, 1977, RI 644

Int. Cl.[2] C07D *401/04;* A61K *31/495;* C07D *401/10;* A61K *31/47*

U.S. Cl. 424—250 **7 Claims**

1. A 3-amino-17a-aza-D-homoandrostane compound of the formula I



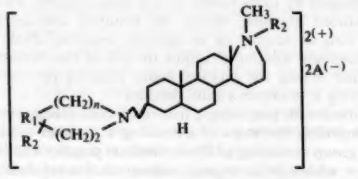
I

wherein

R_1 is methylene or an $>N-CH_3$ group;

n is 1 or 2; and

the symbol represents an α- or β-configuration; or an acid-addition salt or quaternary salt of the formula I(a)



I(a)

thereof, wherein

R_2 is C_1 to C_4 alkyl or C_1 to C_4 alkenyl; and

A is halogen;
but where R_1 is $>N-CH_3$,
R_2 is attached to the nitrogen of the $>N-CH_3$ group.

7. A muscle relaxant composition which comprises at least one acid-addition or quaternary salt of the formula I(a) as defined in claim 1 in association with a pharmaceutically acceptable carrier.

4,200,637

COMBATING ARTHROPODS WITH N,N-DIALKYL-O-(2-SUBSTITUTED-METHYL-PYRIMIDIN-4-YL)-CARBAMIC ACID ESTERS

Fritz Maurer; Rolf Schröder, both of Wuppertal, and Ingeborg Hammann, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

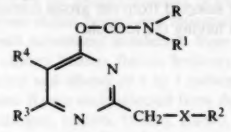
Filed Nov. 13, 1978, Ser. No. 960,153

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752613

Int. Cl.² C07D *239/20*

U.S. Cl. 424—251 **10 Claims**

1. An N,N-dialkyl-0-(2-substituted-methyl-pyrimidin-4-yl)-carbamic acid ester of the formula



in which
R, R^1 and R^2 each independently is alkyl,
X is oxygen or sulphur,
R^3 is hydrogen or alkyl, and
R^4 is hydrogen, alkyl or halogen, or
R^3 and R^4 conjointly form an alkylene bridge.

8. An arthropodicidal composition containing as active ingredients an arthropodicidally effective amount of an ester according to claim 1 in admixture with a diluent.

4,200,638

INDOLE DERIVATIVES AND THERAPEUTICALLY ACTING DRUGS

Jean A. A. J. Hannart, Chaumont-Gistoux, Belgium, assignor to Omnium Chimique Societe Anonyme, Louvain-la-Neuve, Belgium

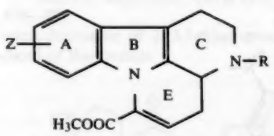
Filed Sep. 27, 1978, Ser. No. 946,456

Claims priority, application France, Sep. 30, 1977, 77 29574

Int. Cl.² A61K *31/44*; D07D *471/04*

U.S. Cl. 424—256 **5 Claims**

1. Indole derivatives of the general formula



(I)

in which R represents a hydrogen atom or a linear or branched, saturated or unsaturated alkyl group having 1 to 5 carbon atoms or a benzyl (i.e. $CH_2-C_6H_5$) group and Z represents either a hydrogen atom or an alkyl, hydroxy, acyloxy, carbamate or methoxy radical or a halogen atom, said compounds being in the form of bases or salts of organic or inorganic acids and in the form of any desired optical isomer or racemic mixture.

4. A drug for treating cardio-circulatory and cerebro-vascular diseases, which contains a therapeutically effective amount of at least one compound according to claim 1 in the form of a base or a pharmaceutically acceptable acid addition salt, together with a pharmaceutically acceptable adjuvant, vehicle or carrier.

4,200,639

SESBANINE AND THE USE THEREOF IN TREATING LEUKEMIC TUMORS

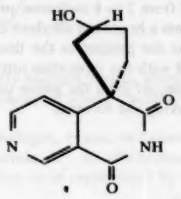
Richard G. Powell, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 29, 1979, Ser. No. 25,131

Int. Cl.² A61K *31/445*; C07D *471/10*

U.S. Cl. 424—256 **4 Claims**

1. A substantially pure chemotherapeutically active alkaloid compound sesbanine having the following structure:



4. A method of treating animals for remission of leukemia of the strain P388 comprising administering by injection to said animals a chemotherapeutic composition comprising a pharmaceutically acceptable vehicle and an amount of substantially pure sesbanine effective to promote said remission.

4,200,640

NITRIC ESTER OF N-(2-HYDROXYETHYL)NICOTINAMIDE AND PHARMACEUTICAL USE

Hiroyuki Nagano, Iwatsuki; Takashi Mori, Tama; Sakae Takaku, Agео; Isao Matsunaga, Tokyo; Tatsuo Kujirai, Ohmiya; Toshichika Ogasawara, Tokyo; Shigeru Sugano, Musashino, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 781,524, Mar. 25, 1977, abandoned. This application Sep. 7, 1978, Ser. No. 940,194

Claims priority, application Japan, Apr. 2, 1976, 51-36101; Jul. 13, 1976, 51-82458; Jul. 15, 1976, 51-83522

Int. Cl.² A61K *31/455*; C07D *213/81, 213/82*

U.S. Cl. 424—266 **17 Claims**

1. Nitric ester of N-(2-hydroxyethyl) nicotinamide or a pharmaceutically acceptable salt thereof.

7. A process for treating circulatory diseases comprising administration to a patient in need of such therapy a circulatory improving-effective amount of the compound of claim 1.

4,200,641

1-[(HETEROCYCLYL)-ALKYL]-4-DIARYLMETHOXY PIPERIDINE DERIVATIVES

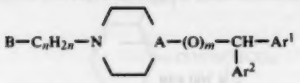
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation of Ser. No. 753,062, Dec. 21, 1976, abandoned, which is a continuation-in-part of Ser. No. 672,919, Apr. 2, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,342

Int. Cl.² A61K *31/445*; C07D *401/06*

U.S. Cl. 424—267 **5 Claims**

1. A chemical compound selected from the group consisting of a compound having the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, substituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

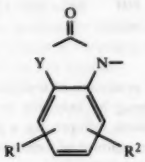
m is the ingeger 1;

A is >CH—

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking B with the piperidine nitrogen atom; and

B is a member selected from the group consisting of:

(a) a radical having the formula

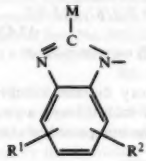


wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

Y is a member selected from the group consisting of oxygen, sulfur and a substituted nitrogen of the formula >N—L wherein said L is a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl, lower alkyloxycarbonyl-lower alkyl, carboxy-lower alkyl, phenyl, phenylmethyl, lower alkylaminocarbonyl, hydroxymethyl, and lower alkenyl; and

(b) a radical having the formula

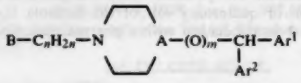


wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

M is a member selected from the group consisting of hydrogen, lower alkyl, phenyl, phenylmethyl, mercapto, lower alkylthio, amino, lower alkylcarbonylamino, lower alkyloxycarbonylamino, and cycloalkyl having from 3 to 6 carbon atoms.

5. A pharmaceutical composition comprising an inert carrier material and as an active ingredient an effective antihistaminic or anti-anaphylactic amount of a chemical compound selected from the group consisting of a compound having the formula



and the pharmaceutically acceptable acid addition salts thereof, wherein:

Ar^1 and Ar^2 are each independently selected from the group consisting of phenyl, substituted phenyl and pyridinyl, wherein said substituted phenyl is phenyl having from 1 to 2 substituents independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, trifluoromethyl and nitro;

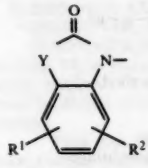
m is the integer 1;

A is >CH—

n is an integer of from 2 to 6 inclusive, provided that when C_nH_{2n} represents a branched alkylene chain, then at least 2 carbon atoms are present in the linear portion of the chain linking B with the piperidine nitrogen atom; and

B is a member selected from the group consisting of:

(a) a radical having the formula

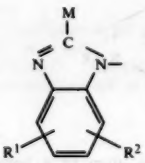


wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl; and

Y is a member selected from the group consisting of oxygen, sulfur and a substituted nitrogen of the formula >N—L wherein said L is a member selected from the group consisting of hydrogen, lower alkyl, lower alkylcarbonyl, lower alkyloxycarbonyl-lower alkyl, carboxy-lower alkyl, phenyl, phenylmethyl, lower alkylaminocarbonyl, hydroxymethyl, and lower alkenyl; and

(b) a radical having the formula



wherein:

R^1 and R^2 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, and trifluoromethyl; and

M is a member selected from the group consisting of hydrogen, lower alkyl, phenyl, phenylmethyl, mercapto, lower alkylthio, amino, lower alkylcarbonylamino, lower alkyloxycarbonylamino, and cycloalkyl having from 3 to 6 carbon atoms.

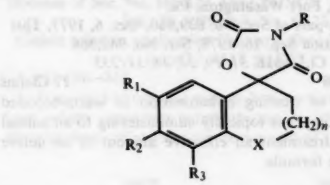
4,200,642

SPIRO-OXAZOLIDINDIONES

Rodney C. Schnur, Noank, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 21, 1978, Ser. No. 935,199
Int. Cl.[2] A61K *31/42*; C07D *263/44*
U.S. Cl. 424—272 23 Claims

1. A compound of the formula



and the pharmaceutically acceptable salts thereof, wherein X is selected from the group consisting of oxygen and sulfur;

n is one or two;

R is selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms, benzyl and monosubstituted benzyl, wherein said substituent is selected from the group consisting of chloro, bromo, fluoro, hydroxy, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms;

and R_1, R_2 and R_3 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, alkyl of 1 to 3 carbon atoms, phenyl and monosubstituted phenyl, wherein said substituent is selected from the group consisting of chloro, bromo, fluoro, hydroxy, alkyl of 1 to 3 carbon atoms and alkoxy of 1 to 3 carbon atoms.

20. A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound of claim 1 in an amount effective for the treatment of diabetes-associated complications.

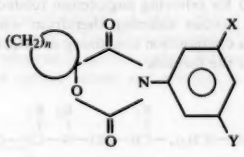
4,200,643

COMBATING FUNGI WITH SPIRO DERIVATIVES OF 3-(3,5-DIHALOGENOPHENYL)-OXAZOLIDINE-2,4-DIONES

Hans-Joachim Knops, Wuppertal; Hans-Georg Heine, Krefeld; Wilfried Draber, Wuppertal, and Wilhelm Brandes, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 29, 1979, Ser. No. 7,284
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1978, 2804824
Int. Cl.[2] A01N *9/22*; C07D *263/52*
U.S. Cl. 424—272 11 Claims

1. A spiro derivative of 3-(3,5-dihalogenophenyl)oxazolidine-2,4-dione of the formula



in which

X and Y each independently is halogen, and

n is 2 or 3.

10. A method of combating fungi which comprises applying to the fungi, or to a habitat thereof, a fungicidally effective amount of a compound according to claim 1.

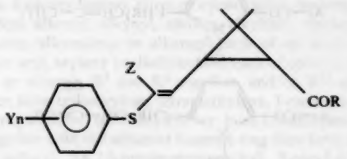
4,200,644

ARYLTHIOVINYLCYCLOPROPANECARBOXYLATE INSECTICIDES

John F. Engel, Medina, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Jan. 26, 1978, Ser. No. 872,413
Int. Cl.[2] A01N *9/12, 9/28*; C07C *149/40*; C07D *307/46*
U.S. Cl. 424—274 4 Claims

1. A compound of the formula



wherein

Y is independently halogen; cyano, lower alkyl, lower haloalkyl, lower alkoxy or lower alkylthio and n is 0, 1, 2, or 3;

Z is hydrogen, halogen, cyano, or lower alkyl; and

R is OR^1 wherein R^1 is allethrolonyl, tetrahydrophthalimidomethyl, or is represented by the formula

in which

R^2 is hydrogen, lower alkyl, ethynyl, cyano or trihalomethyl;

R^3 is divalent oxygen, divalent sulfur or vinylene;

R^4 and R^5 are independently hydrogen, lower alkyl, phenyl, phenoxy, benzyl, phenylthio, or are joined to form a divalent methylenedioxy group attached to two adjacent ring carbons of a phenyl ring.

2. A method for controlling insects which comprises applying to the locus where control is desired an insecticidally effective amount of the compound of claim 1 wherein R is $—OR^1$.

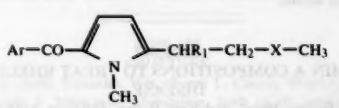
4,200,645

PYRROLE DERIVATIVES

Alexander C. Goudie, Harlow, England, assignor to Beecham Group Limited, Great Britain

Filed May 5, 1978, Ser. No. 903,194
Claims priority, application United Kingdom, May 10, 1977, 19465/77; Jan. 28, 1978, 03529/78
Int. Cl.[2] C07D *207/32*; A61K *31/40*
U.S. Cl. 424—274 73 Claims

1. A compound of the formula:



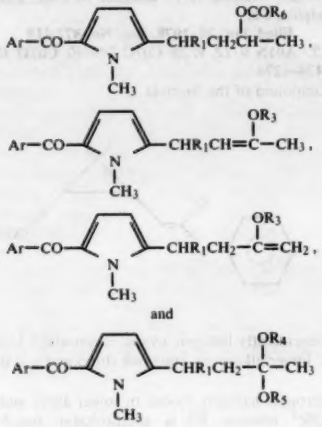
wherein

R_1 is hydrogen or methyl;

Ar is (a) phenyl unsubstituted or substituted by one or two members selected from the group consisting of fluoro, chloro, methyl, methoxy and tri-fluoromethyl; or (b) thienyl; and

X is CO or CHOH;

or a pro-drug therefore selected from the group consisting of a compound of the formula



and

wherein

Ar and R_1 are as defined above,

R_6 is a member selected from the group consisting of phenyl, alkyl of 1 to 4 carbon atoms, and phenylalkyl of 1 to 4 carbon atoms in the alkyl group, said member being unsubstituted or substituted with hydroxy, acetoxy, methoxy, acetamido, amino, alkylamino or carboxy,

R_3 is alkyl of 1 to 4 carbon atoms or COR_6 wherein R_6 is as herein defined, and

R_4 and R_5 when taken independently are each methyl, ethyl or propyl or when taken together are ethylene or trimethylene.

4,200,646

METHOD OF CONTROLLING THE GROWTH OF MICROORGANISMS USING NITROALKYL THIOCYANATES

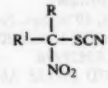
Herbert L. Wehrmeister, Terre Haute, Ind., assignor to International Minerals & Chemical Corporation, Terre Haute, Ind.

Filed Feb. 7, 1979, Ser. No. 10,187

Int. Cl.[2] A01N *9/18;* **C07C** *161/02*

U.S. Cl. 424—302 **7 Claims**

1. A nitroalkyl thiocyanate represented by the formula



wherein R is hydrogen or methyl, R^1 is hydrogen, methyl or ethyl, or R and R^1 can collectively be a cyclic alkyl group of 5 carbon atoms.

4,200,647

VITAMIN A COMPOSITIONS TO TREAT RHEUMATIC DISEASE

Werner Bollag, Basel, and Kurt Reber, Ettingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 12, 1978, Ser. No. 968,712

Claims priority, application Switzerland, Dec. 21, 1977, 15795/77

Int. Cl.[2] A61K *31/07, 31/20, 31/38, 31/215*

U.S. Cl. 424—305 **8 Claims**

1. A method for orally treating rheumatic disease in a mammal comprising orally administering to said mammal a retinoid or a pharmaceutically acceptable salt thereof, in an amount effective for treating rheumatic disease.

4,200,648

METHOD OF TREATMENT

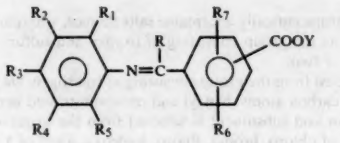
George W. Nuss, Jr., Lansdale; Norman J. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 839,960, Oct. 6, 1977. This application Sep. 15, 1978, Ser. No. 942,866

Int. Cl.[2] A61K *31/19, 31/24, 31/235*

U.S. Cl. 424—308 **27 Claims**

1. A method of treating inflammation in warm-blooded animals which comprises topically administering to an animal in need of said treatment an effective amount of an active compound of the formula



(I)

where:

Y is hydrogen, alkyl or phenyl,

R is hydrogen, alkyl, or phenyl;

R_1, R_2, R_3, R_4, R_5, and R_6 may be the same or different and are

hydrogen,
alkyl,
nitro,
amino,
halologweralkoxy,
halologweralkyl,
halo,
loweralkoxy, and
hydroxy;

R_3 may also be cycloalkyl, cycloalkenyl or aryl, and

R_7 is hydrogen, hydroxyl, carboxy, carbalkoxy, or halo.

4,200,649

RELIEVING HYPERTENSION WITH CARBOXYALKYLACYLAMINO ACIDS

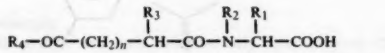
Miguel A. Ondetti, Princeton, and David W. Cushman, West Windsor, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 903,290, May 4, 1978, Pat. No. 4,153,725, which is a division of Ser. No. 684,605, May 10, 1976, Pat. No. 4,105,789. This application Nov. 20, 1978, Ser. No. 962,369

Int. Cl.[2] A61K *31/24, 31/195, 31/205*

U.S. Cl. 424—309 **13 Claims**

1. A method for relieving angiotensin related hypertension in mammalian species suffering therefrom which comprises administering a composition containing an effective amount of a compound of the formula



an physiologically acceptable basic salts thereof, wherein

R_1 is 4-imidazolyl-lower alkylene;

R_2 is hydrogen or lower alkyl;

R_3 is lower alkyl or phenyl-lower alkylene;

R_4 is hydroxy, lower alkoxy or hydroxyamino; and n is 1 or 2.

4,200,650

2-AMINO-CYCLOPENT-1-ENE-1-THIOCARBOXYLIC ACID-DISULFIDES TO TREAT NORADRENERGIC MALFUNCTIONS

György Matolcsy; Piroska Bartók nee Berencsy, both of Budapest; Béla Kiss, Vecses; Eva Palosi, Budapest; Egon Karpáti, Budapest, and László Szporny, Budapest, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

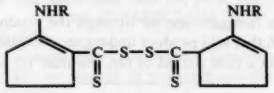
Division of Ser. No. 865,429, Dec. 29, 1977. This application Jan. 25, 1979, Ser. No. 6,523

Claims priority, application Hungary, Dec. 30, 1976, RI 610

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 7 Claims

1. A method of treating mammalian noradrenergic malfunctions which comprises administering to affected mammals effective doses of at least one compound of the formula



wherein R is hydrogen, C_{1-6} alkyl group unsubstituted or substituted by C_{1-4} alkoxy, hydroxy, carboxy or amino, C_{2-4} alkenyl or, C_{3-8} cycloalkyl.

4,200,651

URINE PRESERVATIVE COMPOSITION

Donald P. Griffith, 1200 Moursund, Houston, Tex. 77025

Continuation of Ser. No. 824,612, Aug. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 769,693, Feb. 17, 1977, Pat. No. 4,042,337. This application Dec. 26, 1978, Ser. No. 972,799

Int. Cl.[2] A01N *9/20, 9/24*

U.S. Cl. 424—320 2 Claims

1. A bactericidal urine preservative composition capable of stabilizing pH and uric acid content of urine which comprises a mixture of from about 25 to 75 percent benzyl (dodecyl carbamylmethyl) dimethyl ammonium chloride and 75 to 25 percent acetohydroxamic acid.

4,200,652

ALKANOLAMINE DERIVATIVES

Michael S. Large, and Leslie H. Smith, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 745,162, Nov. 26, 1976, Pat. No. 4,115,409. This application Aug. 2, 1978, Ser. No. 930,164

Claims priority, application United Kingdom, Dec. 5, 1975, 50039/75

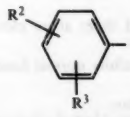
Int. Cl.[2] A61K *31/165;* C07C *103/22*

U.S. Cl. 424—321 8 Claims

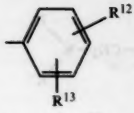
1. An alkanolamine derivative selected from the group consisting of a compound of the formula:

$$R—OCH_2.CHOH.CH_2NH—A—CO—NH—Y—R^1$$

wherein A is alkylene of 2 to 12 carbon atoms; wherein Y is a direct link, or alkylene of up to 6 carbon atoms or alkyleneoxy of from 2 to 6 carbon atoms; and wherein R is aryl of the formula:



and R^1 is aryl of the formula:



or cycloalkyl of up to 10 carbon atoms; wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro, or cyano, alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together, and/or R^{12} and R^{13} together, form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; provided that A separates imino and carbonyl by at least 2 carbon atoms; and a non-toxic pharmaceutically-acceptable acid-addition salt thereof.

4,200,653

INSECTICIDAL COMPOUND AND METHOD OF USE

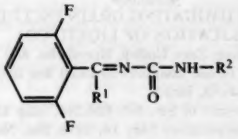
Roger K. Huff, Wokingham; David D. Evans, Binfield, and Nicholas H. Anderson, Wokingham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sep. 29, 1978, Ser. No. 947,701

Int. Cl.[2] A01N *9/20;* C07C *127/19*

U.S. Cl. 424—322 6 Claims

1. A compound of the formula (I):



(I)

wherein R^1 is alkyloxy; alkoxy of 1–12 carbons, unsubstituted or substituted by phenyl, fluorine, chlorine, bromine or iodine; phenoxy, unsubstituted or substituted by lower alkyl, lower alkoxy, fluorine, chlorine, bromine or iodine; alkylthio of up to 4 carbons, unsubstituted or substituted by phenyl; phenylthio, unsubstituted or substituted by fluorine, chlorine, bromine, iodine, lower alkyl, lower alkoxy or lower haloalkyl; or amino, unsubstituted or substituted by from one to two unsubstituted alkyl of up to 3 carbons or by such alkyl substituted by ethoxy or phenyl; and R^2 is an unsubstituted phenyl, a phenyl substituted by fluorine, chlorine, bromine, iodine, lower haloalkyl, unsubstituted phenoxy or phenoxy substituted by fluorine, chlorine, bromine, iodine, or lower haloalkyl.

4. An insecticidal composition comprising an insecticidally effective amount of a compound according to claim 1 in association with an inert diluent or carrier material.

4,200,654

OVICIDES

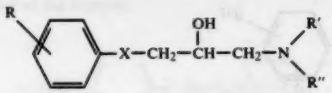
Robert G. Stein, Kenosha, Wis.; Terry L. Couch, Waukegan, and Raymond J. Michaels, Mundelein, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 24, 1978, Ser. No. 963,666

Int. Cl.[2] A01N *9/00, 9/20*

U.S. Cl. 424—330 10 Claims

1. A method of combating the hatching of eggs of crop-damaging insects consisting essentially in applying to the habitat of said eggs an ovicidal amount of a compound of the formula



wherein X is O, S or SO_2, R represents H or one or more halogen, loweralkyl, —CH=CH—CH=CH— attached to two adjacent positions, CN, NO_2, loweralkyloxy, loweralkylcarbonyl or loweralkylmercapto, R′ is H, loweralkyl, benzyl or R″, and R″ is $CH_2C{=}CH$, $CMe_2C{=}CH$ or $CHMeC{=}CH$ and simple acid addition salts thereof, together with an agriculturally acceptable carrier.

4,200,655

BENZYL ALCOHOL VIRUCIDAL PROCESS

Alfred E. Farah, Schodack, and William G. Gorman, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,792
Int. Cl.² A61K *31/045*
U.S. Cl. 424—343 **5 Claims**

1. The process of neutralizing or destroying a rhinovirus or an influenza virus on a person which comprises topically applying to said virus a virucidally effective amount of benzyl alcohol.

4,200,656

METHOD FOR FUMIGATING GRAIN INCLUDING THE APPLICATION OF LIQUID CO_2

Shlomo Cohen, Omer; Zeev Gollop, Beersheba, and Levi Klein, Rechovot, all of Israel, assignors to Dead Sea Bromine Company Ltd., Beersheba, Israel

Continuation-in-part of Ser. No. 686,246, May 13, 1976, abandoned. This application May 18, 1978, Ser. No. 907,364
Claims priority, application Israel, May 22, 1975, 47341
Int. Cl.² A01F *25/00*
U.S. Cl. 426—331 **3 Claims**

1. A method for fumigating grain stored in a bin by the gravity penetration method comprising applying methyl-bromide to the top of said bin and spraying liquid CO_2 at the top of said bin at the upper layer of grain stored therein by providing a liquid CO_2 container with a delivery conduit in fluid communication therewith and providing said delivery conduit with an outlet remote from said container wherein the inner cross-sectional area of said conduit is at least about 12 times as great as the cross-sectional area of said outlet and passing liquid CO_2 from said container through said delivery conduit to the outlet of said delivery conduit under such conditions that liquid CO_2 emerges from the outlet and flows without the formation of solid CO_2 in gaseous form by gravity together with the methyl bromide to the bottom of the bin.

4,200,657

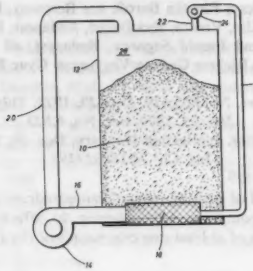
LOW AIR FLOW FUMIGATION METHOD

James S. Cook, P.O. Box 5421, Houston, Tex. 77021

Filed Nov. 9, 1978, Ser. No. 958,984
Int. Cl.² A23L *3/34*
U.S. Cl. 426—419 **9 Claims**

1. A method of fumigating an agricultural product stored in a container, comprising the steps of:

introducing a gaseous chemical fumigant into the container, the fumigant being selected for minimal sorption of the fumigant by the product; and



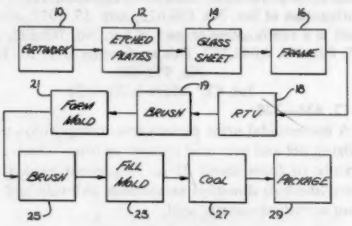
forcing the fumigant and air through the product at a flow rate such that said product undergoes one gaseous volume change in a time period of not less than 1.5 hours.

4,200,658

METHOD FOR MAKING CANDY IN DETAILED DESIGNS

Sandra J. Katzman, and Ellen F. Katzman, both of 7925 Etiwanda Ave., Reseda, Calif. 91335

Filed Dec. 18, 1978, Ser. No. 970,554
Int. Cl.² A23G *3/12*
U.S. Cl. 426—512 **10 Claims**



1. A method for molding confectionery material comprising the steps of:

(a) providing a plate having an upper surface to form a design to be duplicated with confectionery material and having a generally flat lower surface;

(b) providing a sheet to accomodate one or more of said plates;

(c) connecting one or more of said plates to said sheet;

(d) providing a frame to create a border for said plate on said sheet;

(e) providing a room temperature vulcanizing silicone rubber material and curing agent;

(f) mixing said silicone rubber material and said curing agent together to form a viscous mass;

(g) brushing a thin coating of said viscous mass on said plate's upper surface;

(h) pouring more of said viscous mass onto the plate and onto said sheet so as to cover the bordered areas to the top of said frame;

(i) curing said viscous mass at room temperature to form a mold;

(j) further curing said mold on said sheet at an elevated temperature;

(k) cooling said mold sufficiently to allow normal handling without use of gloves;

(l) separating said mold from said plate;

(m) heating said confectionery material until it is liquid and pourable;

(n) lightly brushing a thin coating of said confectionery material on the interior surface of said mold;
(o) filling the mold cavity with confectionery material;
(p) cooling said filled mold for a period of time depending upon the type and dimension of said confectionery material to harden said material; and
(q) removing said material from said mold.

4,200,659

FLAVORING COMPOSITIONS CONTAINING DIALKYL-α,β-DIACYL SUCCINATES

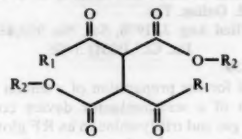
Brian J. Willis, Bergenfield, N.J.; Frank Fischetti, Jr., Flushing, and Robert G. Eilerman, Hempstead, both of N.Y., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Division of Ser. No. 698,741, Jun. 22, 1976, Pat. No. 4,140,134, which is a continuation-in-part of Ser. No. 602,301, Aug. 6, 1975, abandoned. This application Jun. 26, 1978, Ser. No. 919,137

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—534 7 Claims

1. A flavor composition comprising a flavor component and 0.0001% to 30% by weight of a dialkyl-α,β-diacyl succinate having the formula:



in which R_1 is a straight or branched chain alkyl having less than 6 carbon atoms or cyclohexyl and R_2 is a straight or branched chain alkyl having less than 7 carbon atoms or cyclohexyl, the organoleptic properties of said flavor component being enhanced by said succinate.

4,200,660

AROMATIC SULFUR FLAVORING AGENTS

Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament, and Max Stoll, both of Petit-Lancy, all of Switzerland, assignors to Firmenich & Cie., Geneva, Switzerland

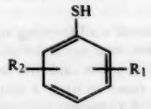
Division of Ser. No. 825,111, Mar. 11, 1977, Pat. No. 4,113,891, which is a division of Ser. No. 482,819, Jun. 24, 1974, Pat. No. 4,038,435, which is a division of Ser. No. 243,866, Apr. 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sep. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, Apr. 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, Apr. 30, 1965, abandoned. This application Nov. 4, 1977, Ser. No. 874,003

The portion of the term of this patent subsequent to Jul. 6, 1993, has been disclaimed.

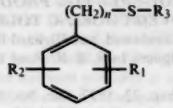
Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—535 38 Claims

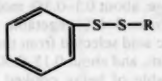
1. A composition selected from the group consisting of foodstuffs and beverages to which has been added an effective, flavor-modifying amount of an aromatic sulfur compound selected from the group of compounds having the general formu' e:



wherein R_1 is hydrogen, hydroxyl, methyl, ethyl, methoxy, or ethoxy and R_2 is methyl or hydrogen; and



wherein R_1 and R_2 are hydrogen, R_3 is methyl or benzyl and n is 0 or 1; and



wherein R is methyl or phenyl.

4,200,661

GELLING COMPOSITIONS FOR FOOD PRODUCTS

Gérard Brigand; Horst Kragen, and Robert Rizzotti, all of Carentan, France, assignors to Société CECA S.A., Velizy Villacoublay, France

Filed May 11, 1977, Ser. No. 795,917

Claims priority, application France, May 12, 1976, 76 14240; Jul. 9, 1976, 76 21063

Int. Cl.[2] A23C *9/10;* A23L *2/02*

U.S. Cl. 426—573 10 Claims

1. A gelling composition for use as a food gelling agent in water or milk comprising a first gelling agent which is a galactomannan selected from the group consisting of locust bean, tara and Espina Corona and a second gelling agent which is at least one of an agar and a xanthane, wherein the galactomannan has been submitted to a depolymerization treatment so that its polymerization rate is such that a 1% aqueous solution of the galactomannan has a viscosity from about 300 to 800 centipoises at 25° C., the gelling composition being obtained by precipitation of the two gelling agents from a mixture of their solutions, and the amount of galactomannan being between about 1 and 9 times the amount of the second gelling agent.

4,200,662

FORTIFICATION OF SOFT DRINKS WITH PROTEIN

Gabriele E. Scibelli, New Rochelle, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 739,371, Nov. 5, 1976, abandoned. This application May 22, 1978, Ser. No. 908,486

Int. Cl.[2] A23L *2/02;* A23C *21/00, 23/00*

U.S. Cl. 426—583 11 Claims

1. A method for fortifying liquid acidic soft drinks having a pH within the range of from about 3.1 to about 3.7 with protein while providing a turbid stable suspension therein which does not settle after one month having from about 67% to about 16% light transmittance as measured by a Beckman Spectrophotometer Model DB-G at wave length 640 nm which comprises admixing with said acidic soft drink a protein fortifier composition comprising from about 50% to about 95% of cheese whey protein concentrate having a protein solids concentration between about 25% and about 60% by weight on a dry basis prepared by ultrafiltration of acid cheese whey in combination with from about 5% to about 50% high heat non-fat dried milk , said protein fortifier being admixed in an amount sufficient to add from about 0.1% to about 5% by weight protein based on the total weight of the soft drink, said percentages unless otherwise stated being by weight based on the combined dry weight of said protein concentrate and said non-fat dried milk.

4,200,663

CHOLESTEROL-FREE EGG PRODUCT HAVING IMPROVED COOKING TOLERANCE

Robert D. Seeley, Crestwood, and Richard B. Seeley, Kirkwood, both of Mo., assignors to S. & R. Food Co., Inc., Kirkwood, Mo.

Filed Sep. 23, 1977, Ser. No. 835,865
Int. Cl.[2] A23L *1/32*
U.S. Cl. 426—614 8 Claims

1. An essentially cholesterol-free egg product consisting essentially of, by weight, 84–88% liquid egg whites, about 3% egg white solids, about 2% non-fat dry milk, about 1% carboxymethyl cellulose, about 0.1–0.3% mono- and diglycerides, about 5% water, from 0–4% vegetable oil, about 0.05% to 0.15% of an organic acid selected from the group consisting of citric and adipic acids, and about 0.15–0.50% carrageenan, said product being capable of being cooked in a steam-jacketed vessel into scrambled egg form closely resembling scrambled eggs cooked from whole egg.

4,200,664

ADHERENT CONTROLLED RELEASE PESTICIDES USING ORGANO POLYSILOXANES

Robert W. Young, New York, N.Y.; Samuel Prussin, Carmel, Calif., and Norman G. Gaylord, New Providence, N.J., assignors to Young, Prussin MGK, J.V., New York, N.Y.

Continuation of Ser. No. 696,268, Jun. 15, 1976, abandoned. This application Jul. 24, 1978, Ser. No. 927,584
Int. Cl.[2] A61K *31/695;* A01N *17/08*
U.S. Cl. 427—4 21 Claims

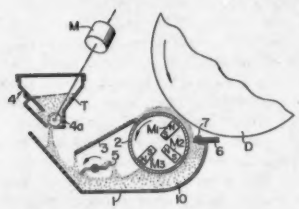
1. A composition consisting essentially of (a) a hydrolyzable silane selected from the group consisting of (1) a hydrocarbon substituted hydrolyzable silane, and (2) an organopolysiloxane containing hydrolyzable silane groups, or a partial hydrolyzate thereof, (b) a hydrolyzable organic titanium compound or a partial hydrolyzate thereof wherein said titanium compound is selected from the group consisting of tetraesters, tetraanhydrides, tetraamides and chelates of glycols, hydroxyacids, dicarboxylic acids, diketones, ketoesters and alkanolamines, and (c) an insecticide, said composition being capable of in situ formation of a polymeric coating.

4,200,665

METHOD FOR CONTROLLING THE TONER CONCENTRATION OF A DEVELOPER USED IN A DRY TYPE DEVELOPING SYSTEM

Koichi Suzuki; Shigeru Suzuki, and Minoru Suzuki, all of Yokohama, Japan

Division of Ser. No. 771,732, Feb. 24, 1977, Pat. No. 4,112,867, which is a continuation of Ser. No. 587,660, Jun. 17, 1975, abandoned. This application May 1, 1978, Ser. No. 901,784
Claims priority, application Japan, Jun. 18, 1974, 49-69335; Jun. 19, 1974, 49-69854
Int. Cl.[2] G03G *13/09*
U.S. Cl. 430—30 5 Claims



1. A method of controlling the dry non-magnetic toner concentration of a developer which comprises a magnetic carrier and the toner and which is used in a copying device which includes a drum having an electrostatic latent image thereon which is contacted by the developer, comprising disposing a magnet adjacent the drum to establish a magnetic field for forming a continuous magnetically attracted brush of the developer and to produce a leakage flux in the vicinity of the developer and the drum, advancing moving support means through a portion of the developer and over the magnetic field so as to pick up the developer due to the action of the magnetic field on the support means with the developer forming the continuous magnetically attracted brush of the developer, shaping the magnetic brush by doctoring the brush to a predetermined height, directing the support means adjacent the drum so as to engage the picked up developer with the surface of the drum, sensing the amount of the magnetic leakage flux from said magnet which passes through the magnetically attracted brush of the developer as it is moved by the support means before it contacts the drum so as to determine a toner concentration which is proportional to the sensed leakage flux, and varying the toner concentration in the developer in accordance with the sensed leakage flux.

4,200,666

SINGLE COMPONENT MONOMER FOR SILICON NITRIDE DEPOSITION

Alan R. Reinberg, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 2, 1978, Ser. No. 930,452
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—39 6 Claims

1. A method for the preparation of a silicon nitride film in the fabrication of a semiconductor device comprising subjectng an inert gas and trisilyamine to an RF glow discharge of 0.04 to 0.20 watts per cm^2 in the presence of said semiconductor device.

4,200,667

PROCESS FOR PRODUCING A PRESSURE-SENSITIVE CARBONLESS COPY SHEET USING MICROCAPSULES FORMED IN SITU IN A RADIATION CURABLE BINDER

Yu-Sun Lee, Parma, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 773,901, Mar. 3, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,405
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 7 Claims

1. A process for producing a pressure-sensitive carbonless transfer paper comprising the steps of:

(a) preparing a liquid radiation curable hydrophobic emulsion component by dispersing an emulsifier in a radiation curable hydrophobic liquid;

(b) preparing a liquid hydrohilic emulsion component by dispersing a first wall-forming material in a hydrophilic liquid containing at least one chromogenic material, said chromogenic material being soluble in said hydrophilic liquid, said first wall-forming material being reactive with a second wall-forming material to form a polymeric capsule wall, said polymeric capsule wall being substantially insoluble in said liquid radiation curable hydrophobic and said liquid hydrophilic emulsion components;

(c) mixing said liquid radiation curable hydrophobic emulsion component with said liquid hydrophilic emulsion component to form an emulsion containing droplets of said liquid hydrophilic emulsion component dispersed in said liquid radiation curable hydrophobic emulsion component;

(d) adding said second wall-forming material to said emulsion with agitation, said agitation continuing for a period of time sufficient to allow said first and second wall-forming materials to react to form a dispersion of microcapsules in said liquid radiation curable hydrophobic emulsion component, said microcapsules having cell walls substanatially impermeable to said liquid hydrophobic and said liquid hydrophilic emulsion components;

(e) applying said dispersion of said microcapsules to a substrate; and

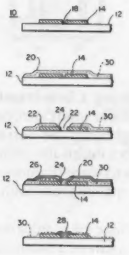
(f) curing said dispersion of said microcapsules by subjecting said dispersion of said microcapsules on said substrate to radiation for a period of time sufficient to cure said dispersion of said microcapsules by polymerization of said liquid radiation curable hydrophobic emulsion component, thereby producing a tack-free resinous film on said substrate substantially without removal of solvents or other liquids.

4,200,668

METHOD OF REPAIRING A DEFECTIVE PHOTOMASK

Paul D. Segal, Plainsboro Township, Mercer County, and Ching-Ping Wong, West Windsor Township, Mercer County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,607
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—53.1 **30 Claims**



1. A method of repairing a defect in a film on a substrate comprises:

coating the surface of the defective film with a solvent soluble layer;

locating the defect to be repaired;

forming a window through said solvent soluble layer and said underlying defective film in the area around said defect;

coating said defective film and window with a non-solvent soluble opaque film; and

stripping said solvent soluble layer from said substrate with solvent so as to remove said solvent soluble layer and said non-solvent soluble film thereover from said substrate leaving said non-solvent soluble film on said substrate in the area of said window.

4,200,669

LASER SPRAYING

Robert J. Schaefer, Springfield, and Jack D. Ayers, Oakton, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 22, 1978, Ser. No. 962,855
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—53.1 **16 Claims**

1. A method of spraying a surface which comprises:

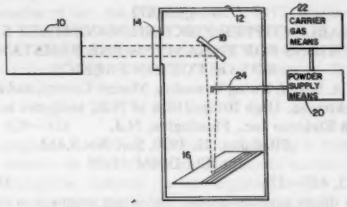
selecting a powder with a vapor pressure from 10^{-2} to 10^{-1} atmosphere in excess of the ambient pressure at a temperature up to about 500° C. above the melting point thereof and with a heat absorption coefficient from 0.2 to 1.0;

introducing said powder into a laser beam with a wavelength smaller than the diameter of said powder and a power density of at least one kW/cm^2 at the point of entry; and

directing said laser beam on the surface to be sprayed.

12. A system for modifying a surface by spraying which comprises:

a laser for projecting a beam with a power density and wavelength of such magnitude to vaporize powder particles on the side exposed to said laser sufficiently rapidly to propel said particles to said surface at such velocity as is required to effect the intended modification, said powder having a vapor pressure from 10^{-2} to 10^{-1} atmosphere greater than the ambient pressure at a temperature up to about 500° C. above the melting point thereof;



a source of supply for said powder;

means for transporting said powder to said laser beam from said supply; and

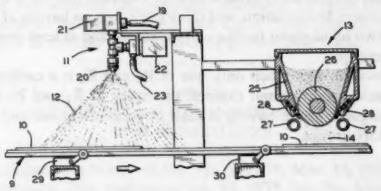
means for introducing said powder into said laser beam from said transporting means at a distance from said surface.

4,200,670

STACKING GLASS SHEETS

Eberhard R. Albach, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Sep. 21, 1977, Ser. No. 835,340
Int. Cl.[2] B65B *33/00*; B65D *85/48*
U.S. Cl. 427—154 **4 Claims**



1. A method of treating a glass sheet for stacking in face-to-face relation with other glass sheets, consisting essentially of applying atomized water, a stain inhibitor, and dry particles of a mechanical separator to a surface of said sheet in a plurality of sequential steps that fuse said stain inhibitor and said mechanical separator to said surface through a water bond.

4,200,671

METHOD FOR REMOVING PAINT FROM A SUBSTRATE

Richard M. Krajewski, St. Louis, and Robert E. Erickson, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 5, 1978, Ser. No. 903,285
Int. Cl.[2] B08B *7/00*
U.S. Cl. 427—154 **8 Claims**

1. A method of removing depositions of hydrophobic material from a substrate comprising the steps of:

(a) applying a primer release coating of a water-insoluble, water-swellable polymer to the substrate,

(b) depositing the hydrophobic material on the primer release coating,

(c) loosening the hydrophobic material by exposing the primer release coating to excessive amounts of an aqueous liquid, and

(d) removing the hydrophobic material from the substrate.

4,200,672

STABLE COPPER ZIRCONIUM COMPLEX SALT SOLUTIONS FOR ENHANCING THE RESISTANCE TO ROT OF COTTON FABRICS

Sherif A. Sherif, Ewing Township, Mercer County, and James E. Hachtmann, High Bridge, both of N.J., assignors to Magnesium Elektron Inc., Flemington, N.J.

Filed Jan. 22, 1979, Ser. No. 5,412
Int. Cl.[2] D06M *13/50*
U.S. Cl. 427—226 10 Claims

1. A dilute aqueous copper zirconium ammonium carbonate solution containing less than about 0.5% Cu and 1.5% ZrO_2 having a Cu:Zr atomic ratio within the range from about 0.5:1 to 1:1 and having an enhanced resistance to gelation and the formation of precipitates upon storage at atmospheric temperatures comprising copper zirconium ammonium carbonate in solution in water in a concentration within the range from about 0.1% to about 0.5% Cu, and an amount sufficient to inhibit gelation and precipitation of a vicinal diol compound having the general formula:

$$R_1—CHOH—CHOH—R_2$$

wherein

R_1 and R_2 are selected from the group consisting of (1) carboxylic acids groups COOH and salts thereof COOM, where M is a cation, and (2) organic groups having at least two up to about twelve carbon atoms, and at least one OH group;

provided, that when only one of R_1 and R_2 is a carboxylic acid group or salt thereof, the other of R_1 and R_2 is an organic group having at least two carbon atoms and two OH groups.

4,200,673

METHOD OF FORMING FIRE RETARDANT PRINTED WOOD PANELING

Wallace A. Steele, High Point, N.C., assignor to The Lilly Company, High Point, N.C.

Filed Nov. 15, 1977, Ser. No. 851,730
Int. Cl.[2] B05D *3/12, 1/36, 3/00*
U.S. Cl. 427—264 6 Claims

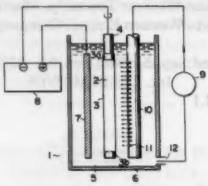
1. A method of producing a wood-surfaced substrate which retains its wood character over a portion of its surface enabling the wood substrate to be finished in conventional fashion while modifying the wood surface to protect the wood against fire by reducing the flame spread rating comprising, embossing the wood surface to be finished to depress the surface in a relatively uniform pattern of depressed portions covering from about 20% up to about 70% of the surface area of the wood to a depth of at least about 0.01 inch, filling said depressed portions with an intumescent fire retardant filler, substantially removing excess filler from the undepressed portions of the wood surface and then drying the fire retardant filler and covering the filled surface with a decorative covering.

4,200,674

METHOD OF PREPARING HEAT-TRANSFER MEMBERS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Inc., Yokohama, Japan

Continuation of Ser. No. 556,203, Mar. 7, 1975, Pat. No. 4,120,994. This application Feb. 9, 1978, Ser. No. 876,551
Claims priority, application Japan, Mar. 11, 1974, 49/27077; Nov. 6, 1974, 49/127713; Nov. 29, 1974, 49/138062; Jan. 14, 1975, 50/6695
The portion of the term of this patent subsequent to Oct. 17, 1995 has been disclaimed.
Int. Cl.[2] B05D *3/12*
U.S. Cl. 427—290 10 Claims



1. A method of preparing a heat-transfer member having a porous metallic heat-transfer interface comprising the steps of:

(a) mechanically roughening the surface of a substrate by providing same with a multitude of small cuts to a depth of at least 0.1 mm so as to form thereon a multitude of minute protrusions closely spaced from each other and uniformly distributed;

(b) disposing said surface of a substrate in contact with a solution containing a salt of a thermally conductive metal; and

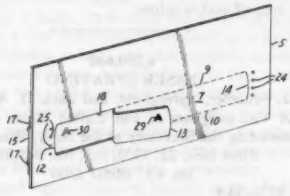
(c) depositing said metal from said solution upon said substrate so as to form a dendritic metallic layer thereon constituting said porous heat-transfer interface.

4,200,675

SHEET FOR TITLING LIGHT-SENSITIVE MATERIAL

Lawrence A. Flor, Anoka, and Kenneth R. Kurttila, Grant Township, Washington County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 16, 1978, Ser. No. 915,978
Int. Cl.[2] B05C *17/08;* B41L *13/02;* B41N *1/24*
U.S. Cl. 428—43 5 Claims



1. A titling sheet for use in producing any selected title to be imparted to light-sensitive material to expose thereon the selected identifying title comprising

an opaque sheet of card stock formed with a rectangular area defined by spaced parallel perforations in the card stock affording facile removal of the card stock within that area;

a strip of ribbon, comprising a transparent backing of polyethylene film 0.75 to 1.0 mil in thickness and a coating of transferable opaque pigment material, disposed on said card stock with the coated surface overlaying and contacting said area defined by said perforations;

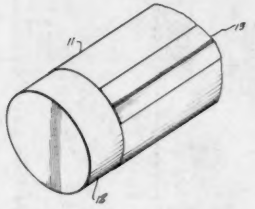
means securing said ribbon to said card stock whereby pressure on said transparent backing will transfer pigment material from the coated surface of said ribbon to said card stock and removal from said ribbon upon the peeling of the area of card stock between said perforation from the card affording transparent areas in said ribbon defining the desired indicia.

4,200,676

METHOD FOR JOINING HEAT-RECOVERABLE SHEET MATERIAL AND RESULTING ARTICLE

Dennis A. Caponigro, Pleasanton, and Eugene F. Lopez, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 664,275, Mar. 5, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,682
Int. Cl.[2] B32B *3/00*
U.S. Cl. 428—57 34 Claims



1. A method for joining the ends of heat recoverable sheet material comprising:
(a) overlapping the ends of the sheet material;
(b) disposing a laminar panel over the line defined by the uppermost of the overlapping ends, said panel comprising a layer of reinforced crosslinked polymer having a reinforcing member associated therewith and a layer of crosslinked adhesive composition coated on one surface of said reinforced polymer layer, said adhesive composition comprising a mixture of a normally adhesive heat softenable polymer and a tackifier;
(c) heating said panel to render the adhesive tacky;
(d) pressing the panel into close contact with the sheet material on either side of said line.

4,200,677

BULLET-PROOF COMPOSITE MATERIAL MOULDABLE INTO FLAT AND CURVED PLATES OR INTO HOLLOW BODIES OF COMPLEX SHAPE

Emilio Bottini, Via Volontari della Liberta 5, Busto Arsizio (Varese), and Giacomo Mazzer, Ponte Lambro (Como), both of Italy

Filed Aug. 29, 1978, Ser. No. 937,580
Claims priority, application Italy, Sep. 12, 1977, 27445 A/77
Int. Cl.[2] F41H *1/02*
U.S. Cl. 428—246 8 Claims

1. A bullet-proof composite material, moldable by high pressure into flat and curved plates or into hollow bodies of complex shape, the material comprising a plurality of cloths of aromatic polyamide fibers superimposed on each other, at least some of which are of plain weave fabric type and others of twill type, each being impregnated with at least one unsaturated polyester resin.

4,200,678

FLEXIBLE MULTILAYER MAGNETIC RECORDING MEDIUM

Philipp Pister, Hassloch; Franz Buettner, Ludwigshafen; Fritz Hammon; Manfred Ohlinger, both of Frankenthal; Heinz Stritzinger, Ludwigshafen; Job-Werner Hartmann, Ludwigshafen, and Walter Schneider, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 758,719, Jan. 3, 1977, abandoned, which is a continuation of Ser. No. 642,070, Dec. 18, 1975, abandoned. This application Mar. 30, 1978, Ser. No. 891,541
Claims priority, application Fed. Rep. of Germany, Dec. 31, 1974, 2461936
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—329 3 Claims

1. A magnetic recording medium comprising a base and, applied thereto, at least two magnetic layers containing an acicular magnetic material in an organic binder system, wherein the upper magnetic layer contains a magnetic pigment giving a signal-to-print-through ratio of less than 55 db and the lower magnetic layer(s) contain magnetic pigments giving a signal-to-print-through ratio of 55 db or more, wherein the said magnetic pigments do not differ essentially in their magnetic properties, and wherein the minimum difference between the signal-to-print-through ratios of the upper and lower layers is at least 2.5 db.

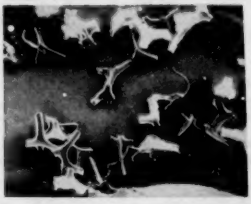
2. A magnetic recording medium comprising a base and, applied thereto, three magnetic layers containing an acicular magnetic pigment in an organic binder system, the magnetic pigment of the upper layer giving a signal-to-print-through ratio of less than 53 db, the magnetic pigment of the middle layer giving values of from 53 to 56 db and the magnetic pigment of the lower layer, which is directly in contact with the base, giving values of more than 56 db, wherein the said magnetic pigments do not differ essentially in their magnetic properties, and wherein the minimum difference between the signal-to-print-through ratios of the upper layer and the layer directly in contact with the base is greater than 3 db.

4,200,679

MICRO-BITS OF EXPANDED FLEXIBLE POLYURETHANES

Max Klein, 257 Riveredge Rd., Tinton Falls, N.J. 07724

Continuation-in-part of Ser. No. 342,535, Mar. 16, 1973, abandoned. This application Sep. 15, 1977, Ser. No. 833,643
Int. Cl.[2] B32B *27/40*
U.S. Cl. 428—402 6 Claims



1. Polyurethane micro-bits prepared from a flexible polyurethane foam and comprising, as best seen under magnification:
(a) broken and inter-connected strand portions from adjacent cells of said flexible foam;
(b) said broken and interconnected strand portions being tripodal particles with generally uneven length legs;
(c) said strand portions having hook-like projections, indentations and flutes extending therefrom, said hook-like projections, indentations and flutes having been formed by the destruction of the cell windows of said flexible foam; and

(d) said strand portions being characterized by a substantially total absence of intact cell windows.

4,200,680

PROCESS FOR PREPARING MAGNETIC IRON OXIDE AND MAGNETIC IRON OXIDE PRODUCED THEREBY

Koji Sasazawa; Shigeo Komine; Tatsuji Kitamoto, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 12, 1975, Ser. No. 586,443
Claims priority, application Japan, Jun. 13, 1974, 49-67300
Int. Cl.[2] H01F *10/02*
U.S. Cl. 428—403 10 Claims

1. A process for preparing magnetic iron oxide, which comprises,

(a) coating the surface of needle-like particles of magnetic iron oxide with a cobalt compound, said iron oxide having the formula FeO_x wherein x is from about 1.36 to 1.49,

(b) placing the coated iron oxide particles in a unidirectionally oriented magnetic field of at least about 300 Oe, thereby to orient most of the needle-like particles in the direction of said magnetic field,

(c) heat-treating said needle-like particles at a temperature of from about 200° to 800° C., in an atmosphere of inert gas, and

(d) conducting said heat treating while said needle-like particles are in a magnetized state or, if said needle-like particles are not in a magnetized state, then conducting said heat treating while simultaneously applying an external magnetic field to said needle-like particles.

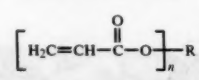
4,200,681

GLASS COATED POLYCARBONATE ARTICLES

Walter L. Hall, Mt. Vernon, Ind., and James S. Humphrey, Jr., Clemmons, N.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 13, 1978, Ser. No. 959,586
Int. Cl.[2] B32B *27/30, 27/06, 27/08, 17/10*
U.S. Cl. 428—412 15 Claims

1. A shaped non-opaque polycarbonate article having improved mar, abrasion, scratch and organic solvent resistance comprising a polycarbonate substrate having deposited thereon (i) a primer coating layer comprised of the photoreaction product of at least one polyfunctional acrylic monomer represented by the general formula



wherein n is an integer having a value of from 2 to 4, and R is a n valent hydrocarbon radical, n valent substituted hydrocarbon radical, n valent hydrocarbon radical containing at least one ether linkage, and a n valent substituted hydrocarbon radical containing at least one ether linkage; and (ii) a thin top layer of vapor deposited glass on said primer coating layer.

4,200,682

INTEGRATED FUEL CELL AND FUEL CONVERSION APPARATUS

Richard A. Sederquist, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 16, 1979, Ser. No. 21,392
Int. Cl.[2] H01M *8/06*
U.S. Cl. 429—17 14 Claims

1. In a method for providing a continuous supply of hydrogen fuel to a fuel cell from a pair of reaction vessels, said fuel cell comprising a fuel electrode, an oxygen electrode, and an electrolyte disposed therebetween, the steps of alternately:

A. making hydrogen fuel in one of said pair of vessels while simultaneously regenerating the other of said pair of vessels; and

B. regenerating said one of said pair of vessels while simultaneously making hydrogen fuel in said other of said pair of vessels;

wherein steps (A) and (B) each comprise the steps of:

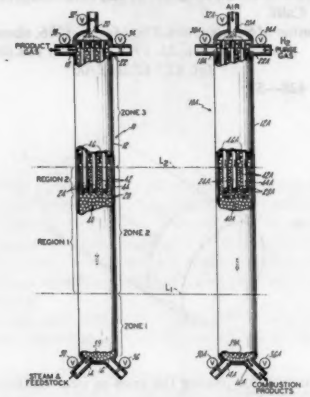
(a) introducing a hydrocarbon feedstock and steam into a first of said vessels, which is making hydrogen;

(b) cracking and steam reforming said feedstock to make said hydrogen in said first vessel using sensible heat stored within said first vessel, said sensible heat being obtained from the step of regenerating said first vessel;

(c) directing the hydrogen produced in step (a) to the fuel electrode of the fuel cell;

(d) introducing air into the oxygen electrode of the fuel cell;

(e) directing the exhaust from the fuel electrode and an



oxygen containing gas into the second of said vessels, which is being regenerated;

(f) preheating said oxygen containing gas and said fuel electrode exhaust separately within said second vessel to temperatures high enough to result in combustion of said oxygen containing gas and said fuel electrode exhaust if they are mixed together;

(g) mixing said preheated oxygen containing gas and said preheated fuel electrode exhaust within said second vessel and combusting said mixture within said second vessel to regenerate said second vessel by storing within material disposed within said second vessel heat from said step of combusting, wherein said step (f) of preheating is accomplished using the heat from said step of combusting and/or sensible heat stored within said second vessel;

(h) exhausting the products of combustion of step (g) from said second vessel.

4,200,683

LEAD-ACID BATTERIES

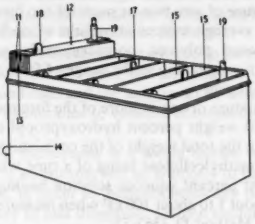
John A. Bant, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jan. 12, 1978, Ser. No. 868,785
Int. Cl.[2] H01M *10/06, 10/44*
U.S. Cl. 429—48 7 Claims

1. A method of producing a lead-acid battery capable of activation by the addition of electrolyte thereto, the method comprising the steps of:

(a) starting with a battery container accommodating at least one pack of battery plate grids having insulating separators interposed between adjacent grids, one set of grids in the pack carrying the lead-acid battery paste required to produce negative plate active material and the remaining grids carrying the paste required to produce positive plate active material,

(b) immersing the grids in the box in sulphuric acid having a specific gravity between 1.21 and 1.30 and passing an electric current between the grids to effect a forming operation on the grids and thereby convert the paste on the grids to the active material of the plates, the specific gravity of said acid rising during the passage of said current to a value between 1.26 and 1.35 at the end of the forming step,



(c) when forming is complete, draining sufficient of said forming acid from the box to prevent the retained forming acid electrically connecting the formed plates during storage, the amount of said retained acid being such that each positive plate contains at least 0.1 cc of the acid/gm of active material, and

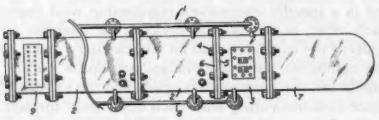
(d) sealing the container with means which prevents ingress of air into the container but allows escape of gases generated in the container.

4,200,684

HIGH RATE DISCHARGE PRIMARY BATTERY

Per Bro, Andover, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Nov. 24, 1978, Ser. No. 963,658
Int. Cl.[2] H01M *2/38*
U.S. Cl. 429—51 **28 Claims**



1. A method for cooling a high rate discharge primary battery having an anode comprised of a metal selected from the group consisting of alkali and alkaline earth metals and aluminum, having a cathode current collector, having internal heat generation and subject to thermal runaway comprising the steps of absorbing the heat of reaction of the primary battery with a substance which is a nonaqueous liquid depolarizer and electrolyte solvent containing a dissolved electrolyte, which substance consists of a material selected from the group consisting of liquid oxyhalides, liquid nonmetallic oxides, liquid nonmetallic halides and mixtures thereof; removing the substance from the site of heat generation within the primary battery to a cooling means; cooling the substance; and recycling the substance to the site of heat generation within the primary battery.

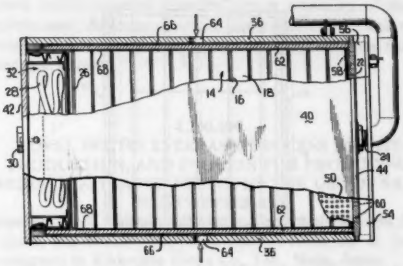
7. A primary battery system comprising a primary battery having a casing and at least one high rate discharge primary cell therein; each of said cells comprising an anode selected from the group consisting of alkali and alkaline earth metals and aluminum, a cathode current collector, a separator between the anode and the cathode collector, and a substance which is a nonaqueous liquid depolarizer and electrolyte solvent containing a dissolved electrolyte, which substance consists of a material selected from the group consisting of liquid oxyhalides, liquid nonmetallic oxides, liquid nonmetallic halides, and mixtures thereof; means for cooling the substance; and fluid communication means operatively positioned between the primary battery and the cooling means to enable the substance to circulate between the primary battery and the cooling means.

4,200,685

POWER MODULE WITH GAS PRESSURIZED DEFORMABLE CASING SIDE PANELS

Ronald I. Klootwyk, San Jose, and Lawrence J. Pagendarm, Santa Clara, both of Calif., assignors to The Continental Group, Inc., New York, N.Y.

Filed Mar. 16, 1979, Ser. No. 21,275
Int. Cl.[2] H01M *2/02*
U.S. Cl. 429—70 **8 Claims**



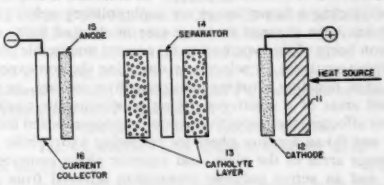
1. A power module casing for receiving plural cell units in adjacent relation and wherein each cell unit includes at least a consumable element with the cell units being progressively moved towards one end of said casing as the consumable elements are consumed, said casing being elongated and of a generally rectangular cross section and including ends and first and second opposing sides, manifold plates within said casing in spaced adjacent relation to said first sides and defining in combination therewith electrolyte supply and return manifolds, and sealing plates within said casing adjacent said second sides, said sealing plates extending at least between said manifolds, and means for introducing a fluid under pressure between each sealing plate and its respective second side for urging each sealing plate inwardly of said casing for sealing engagement with edges of cell units when such cell units are disposed therebetween.

4,200,686

HIGH ENERGY DENSITY THERMAL CELL

Aaron N. Fletcher, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 5, 1979, Ser. No. 9,038
Int. Cl.[2] H01M *4/36*
U.S. Cl. 429—112 **2 Claims**



1. A thermal battery, comprising:

an electrolyte consisting of potassium, lithium, nitrate and chloride ions;

a calcium anode immersed in said electrolyte;

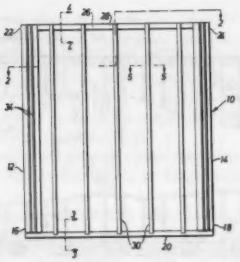
a cathode immersed in said electrolyte;

a separator immersed in said electrolyte between said calcium anode and said cathode;
and a heat source in thermal contact with said electrolyte for supplying thermal energy thereto.

4,200,687
SEPARATOR

Per E. L. Frode, and Karl B. R. Olsson, both of Oskarshamn, Sweden, assignors to Nife Jungner AB, Oskarshamn, Sweden

Filed Apr. 12, 1979, Ser. No. 29,365
Claims priority, application Sweden, Apr. 28, 1978, 7804906
Int. Cl.[2] H01M *2/18*
U.S. Cl. 429—130 **9 Claims**



1. In a separator for a flat, substantially vertical electrode plate in an electric accumulator, manufactured from electrically insulating material and comprising two vertical, U-shaped edge insulating members, the improvement which comprises that the edge insulating members are kept together by a substantially horizontal bottom strip in the bottom portions of said members, and by two parallel, substantially horizontal top strips in the top portions of said members, and at least one insulating rod parallel to the edge insulating members, between each top strip and the bottom strip, so as to form a space for the electrode plate between the edge insulation members, the bottom strip, the top strips and the insulating rods.

4,200,688
METHOD OF TREATING IMAGE-BEARING LITHOGRAPHIC PLATES

Walter L. Garrett, Freeland, and Ralph G. Czerepinski, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 763,262, Jan. 27, 1977, which is a continuation-in-part of Ser. No. 586,455, Jun. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 565,915, Apr. 7, 1975, abandoned. This application Mar. 22, 1978, Ser. No. 888,889
Int. Cl.[2] G03F *7/02*; B41N *1/00*; B41M *5/00*
U.S. Cl. 430—302 **5 Claims**

1. A method of treatment wherein an emulsion is employed for developing a latent image on a photolithographic plate which has been exposed to imagewise modulated light, said emulsion being of the type having (a) a water immiscible phase containing a solvent for selectively removing the non-exposed areas of a negative working photosensitive coating, or the exposed areas of a positive working photosensitive coating, without affecting the respective exposed or non-exposed image areas, and (b) an aqueous phase for rendering hydrophilic the non-image areas of the plate, said aqueous phase comprising water and an active polymer component selected from the group consisting of:

(a) a polyacrylamide-based polymer wherein from about 5 to about 70 percent of the carbonyl sites are carboxyl groups and the balance of said sites are amide moieties;

(b) a physical blend comprised of from about 95 to about 30 weight percent polyacrylamide and from about 5 to about 70 weight percent polyacrylic acid or an alkali metal or ammonium salt thereof;

(c) a physical blend comprised of polyacrylamide, or polyacrylic acid or an alkali metal or ammonium salt thereof, and at least one polyacrylamide-based polymer as described in (a), said polymers being employed in proportions such that of the total carbonyl sites present in the blend, from about 5 to about 70 percent are carboxyl groups and the balance are amide moieties;

(d) a mixture of any two or more of the foregoing (a)–(c);

the weight average molecular weight of each of said polyacrylamide-based polymer, polyacrylamide, and polyacrylic acid or salt thereof being in the range of from about 10,000 to about 500,000; and

(e) a co-mixture of one or more of the foregoing (a)–(d) with up to 30 weight percent hydroxypropyl methylcellulose based on the total weight of the co-mixture, said hydroxypropyl methylcellulose being of a type which produces a 2 weight percent aqueous solution having a viscosity of from about 1 to about 100 cP when measured according to ASTM Method D 2363-72;

said solution being applied in an amount sufficient to render substantially all the non-image areas hydrophilic.

4,200,689
METHOD OF CELL CULTURE USING A DUAL CIRCUIT, WOVEN ARTIFICIAL CAPILLARY BUNDLE

Richard A. Knazek; Pietro M. Gullino, both of Bethesda, Md., and David S. Frankel, Newark, Del., assignors to United States of America, Washington, D.C.

Division of Ser. No. 850,810, Nov. 11, 1977. This application Aug. 29, 1978, Ser. No. 937,762
Int. Cl.[2] A01N *1/02*
U.S. Cl. 435—2 **5 Claims**

1. A method for the maintenance of cells and the formation and maintenance of solid tissues in vitro which comprises:

(a) arranging a plurality of capillaries within a chamber, the capillaries having walls which are permeable to nutrients required for cell growth or maintenance and/or cell products and being arranged with individual capillaries extending in a specific interwoven relationship with respect to each other, said capillaries dividing the chamber by the walls of the capillaries into an intracapillary space within the capillaries and an extracapillary space outside the capillaries, the intracapillary space and the extracapillary space communicating with each other only through the walls of the capillaries;

(b) connecting a first portion of said interwoven capillaries to a first perfusion circuit and a second portion of said interwoven capillaries to a second perfusion circuit;

(c) introducing living cells into the extracapillary space so that the cells will settle onto the capillaries; and

(d) passing perfusate through the intracapillary space of said first and section portions of said capillaries.

4,200,690
IMMUNOASSAY WITH MEMBRANE IMMOBILIZED ANTIBODY

David M. Root, Bedford, and Francis X. Cole, Stow, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Continuation of Ser. No. 751,093, Dec. 16, 1976, abandoned. This application Jul. 14, 1978, Ser. No. 924,562
Int. Cl.[2] G01N *31/14, 31/00*
U.S. Cl. 435—7 **11 Claims**

1. A method for detecting the presence of a diagnostic antigen in an unfractionated sample of feces or colon aspirate dispersed in a liquid, comprising:

immersing in the sample first and second microporous membranes each of which has a network of voids permitting liquid flow therethrough, the first membrane being a test membrane and having immobilized to its external and internal surfaces a first antibody which is specifically

immunochemically reactive with said antigen, the second membrane being a control membrane having immobilized on its external and internal surfaces a second antibody which is immunochemically non-reactive with said antigen, said membranes having capillary pore sizes in the range from about 25 nanometers to 25 micrometers and having a thin, water-insoluble coating of an inert proteinaceous material on their surfaces, said antibodies being immobilized to said coatings, said first and second membranes being immersed together in the sample and being treated essentially identically in all steps:

incubating the membranes in said sample to permit immunochemical reaction between the immobilized antibody of the first membrane and the antigen to be detected;

washing the membranes to remove non-specifically bound materials;

immersing the membranes in a serum diluted solution of a conjugate of an enzyme and an antibody to the antigen to be detected, in order to immunochemically bind the conjugate to any of said diagnostic antigen bound to said first immobilized antibody on the test membrane;

again washing the membranes to remove non-specifically bound materials;

thereafter testing the membranes for any activity of the enzyme moiety of the conjugate bound thereto; and

comparing the first and second membranes for evidence of enzyme activity, any substantial difference being indicative of the presence of the diagnostic antigen in the sample.

4,200,691

METHOD FOR ISOLATING MB CREATINE KINASE

John A. Buege; Michael E. Hickey, and Gopal S. Rautela, all of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 15, 1978, Ser. No. 878,001

Int. Cl.[2] C12Q *1/50*

U.S. Cl. 435—17 **8 Claims**

1. In a process for separating the isoenzymes of creatine kinase from a mixture of the isoenzymes comprising contacting the mixture with an ion exchange resin and selectively eluting the isoenzymes from the resin, the improvement comprising contacting the mixture with a mixed bed resin containing anion exchange resin and excess cation exchange resin and initially eluting MB creatine kinase isoenzyme.

4,200,692

PROCESS FOR THE PRODUCTION OF XYLOSE BY ENZYMATIC HYDROLYSIS OF XYLAN

Jürgen Puls, Pinneberg; Michael Sinner, Dassendorf, and Hans-Hermann Dietrichs, Reinbek, all of Fed. Rep. of Germany, assignors to Projektierung Chemische Verfahrenstechnik GmbH, Ratingen, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,713

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643800

Int. Cl.[2] C12P *19/14*

U.S. Cl. 435—99 **8 Claims**

1. A process for the preparation of xylose by enzymatic hydrolysis of xylan comprising treating an aqueous solution containing the xylan with:

(a) a first carrier having bonded thereto enzymes of the xylanolytic type wherein substantially all of said enzymes are xylanase enzymes, and

(b) a second carrier having bonded thereto enzymes of the xylanolytic type wherein substantially all of said enzymes are selected from the group consisting of β-xylosidase and β-xylosidase and uronic acid-splitting enzymes and hydrolyzing said treated solution.

4,200,693

PROCESSES FOR PRODUCING GLUCAN USING ELSINOE

Koji Yokobayashi, and Toshiyuki Sugimoto, both of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Mar. 29, 1978, Ser. No. 891,386

Claims priority, application Japan, Mar. 29, 1977, 52/34946; Jul. 25, 1977, 52/89038

Int. Cl.[2] C12P *19/04*; C12R *1/645*

U.S. Cl. 435—101 **2 Claims**

1. A process for producing elsinan, a glucan consisting essentially of repeating units of [3)-Glc-(1→4)-Glc-(1→4)-Glc-(1→], (wherein Glc represents α-D-glucopyranose residue), comprising cultivating microorganisms of genus Elsinoe capable of producing said elsinan, on a nutrient medium containing a carbon source selected from the group consisting of starch hydrolyzates, mannose, fructose, mannitol, xylose, and mixtures thereof, to produce the elsinan, and separating and recovering said elsinan.

4,200,694

NOVEL PECTIN ESTERASE, PROCESS FOR ITS PRODUCTION, AND PROCESS FOR PRODUCING DEMETHOXYLATED PECTIN BY THE USE OF SAID PECTIN ESTERASE

Shigetaka Ishii, Noda; Keiichi Kiho, Toyohashi; Shinichi Sugiyama, and Hiroshi Sugimoto, both of Noda, all of Japan, assignors to Kikkoman Shoyu Co., Ltd., Noda, Japan

Filed Sep. 26, 1978, Ser. No. 945,882

Claims priority, application Japan, Oct. 8, 1977, 52-120504; Oct. 12, 1977, 52-121398

Int. Cl.[2] C12D *13/04*; A23L *1/04*

U.S. Cl. 435—101 **11 Claims**

1. A novel pectin esterase having the following characteristic properties:

(1) It acts upon the methyl ester bond of pectin to hydrolyze the methyl ester bond randomly; It is specific to the methyl ester bond of pectin and demonstrates no activity on ethyl ester, propyl ester and ethylene glycol ester bonds;

(2) Its optimum pH for its action is about 4.5 and its stable pH range is 3 to 6;

(3) Its action temperature is in the range of 25° to 50° C., in particular, 40° to 45° C.;

(4) It completely loses its activity by heat-treatment at 60° C. for 10 minutes or at a pH value below 2 or above 8;

(5) It is inhibited by Hg^{++}, Cu^{++} and Ag^{+}; There is no particular activator nor stabilizer for it;

(6) It has a molecular weight of 35,000 as measured at 4° C. in 0.1 M ammonium acetate buffer solution having a pH value of 5.0;

(7) It is an acidic protein having an isoelectric point of PI 4.1.

4,200,695

FLOCS FOR FILTRATION AND DEIONIZATION PREPARED FROM CATIONIC AND ANIONIC EMULSION ION EXCHANGE RESINS

Berni P. Chong, North Wales; Eric G. Isacoff, Richboro, and James W. Neely, Horsham, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

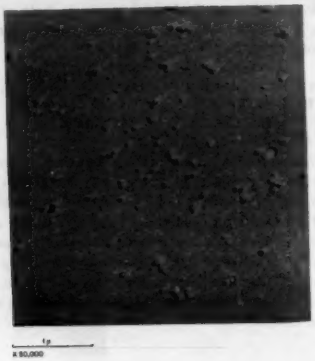
Filed Sep. 18, 1978, Ser. No. 943,890

Int. Cl.[2] B01D *15/04*; C02B *1/40*; C08F *6/22*

U.S. Cl. 521—28 **8 Claims**

1. A novel ion exchange material having both cation exchange and anion exchange properties comprising a floc of beads of one or more cation exchange resins and beads of one or more anion exchange resins in a weight ratio of from about 9:1 to about 1:9 cation resin to anion resin, cohered by electrostatic attraction, the beads of each resin being approximately

spherical beads of crosslinked copolymer having diameters within the range from about 0.01 to about 1.5 micrometers and



bearing from about 0.7 to about 1.5 ion exchange functional groups per monomer unit.

4,200,696

PROCESS FOR PREPARING EXPANDIBLE PARTICLES OF STYRENE-BASED POLYMERS

Gianfranco Biglione, Mantova; Guido Bertazzoni, Campitello Di Marcaria, and Antonio Alvares, Mantova, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 444,391, Feb. 21, 1974, abandoned, Ser. No. 660,629, Feb. 23, 1976, abandoned, and Ser. No. 820,243, Jul. 29, 1977, abandoned. This application Feb. 27, 1979, Ser. No. 15,599

Int. Cl.[2] **C08V** *9/12;* **C08J** *9/22*

U.S. Cl. 521—58 **16 Claims**

1. In a process for preparing shaped molded bodies of expanded styrene-based polymers which comprises, in the order stated, polymerizing, in the presence or absence of an expanding agent, styrene or a mixture of styrene with at least one other monomer copolymerizable therewith, adding the expanding agent if it was not present during the polymerization, pre-expanding the expandible particles obtained, ageing the pre-expanded particles, and molding the pre-expanded aged particles in a mold which is pressure-resistant but not gas-tight, the improvement which consists in

(a) shortening the residence time in the mold;

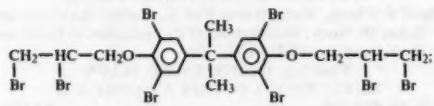
(b) restricting shrinkage of the shaped body thickness to $\leqq 1\%$;

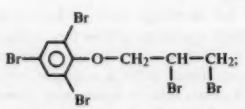
(c) Restriction the (total) moisture content of the expandible particles to $\leqq 3\%$;

(d) insuring that the expanded shaped body will have an essentially uniform, fine-cell homogeneous structure; and

(e) eliminating odors during the pre-expansion step: by

effecting the polymerization in the presence of at least one organic brominated compound having one of the following formulae:





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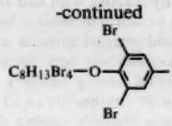
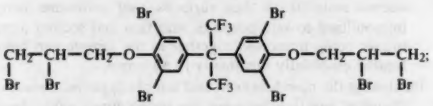
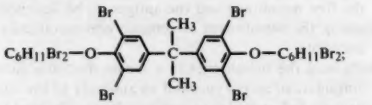
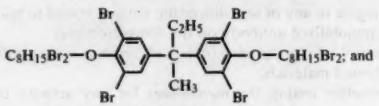
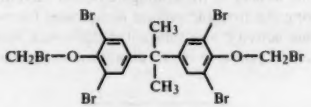










said organic brominated compound being used in an amount of from 0.001% to 0.5% by weight with respect to the weight of the styrene or mixture of styrene and at least one other monomer copolymerizable with styrene.

4,200,697

PROCESS FOR THE PRODUCTION OF POLYESTER SILICATE PLASTICS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 951,573, Oct. 16, 1978, which is a continuation-in-part of Ser. No. 794,915, May 9, 1977, Pat. No. 4,125,498, which is a continuation-in-part of Ser. No. 652,727, Jan. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 562,201, Apr. 14, 1975, abandoned. This application Feb. 7, 1979, Ser. No. 10,061

Int. Cl.[2] **C08F** *2/00, 6/00*

U.S. Cl. 521—83 **9 Claims**

1. The process for the production of polyester silicate plastic by mixing the following components:

(a) 15 to 70 parts by weight of an unsaturated polyester resin which consists of a solution of an unsaturated linear polymer in a liquid monomer that is capable of copolymerizing with the linear polymer;

(b) a catalytic amount of a free-radical initiator;

(c) 30 to 80 parts by weight of an inorganic water-binding agent, said water-binding agent being capable of absorbing water to form a solid or a gel and being based on the weight of Components (a) and (b);

(d) 1 to 4 parts by weight of water to each 4 parts by weight of the inorganic water-binding agent, with the proviso that Component (d) is added last and that an oxidated silicon compound is added with one or more of the components.

8. The process of Claim 1 wherein the oxidated silicon compound is selected from the group consisting of silica, alkali metal silicate, alkaline earth metal silicates, natural silicates containing free silicic acid groups and mixtures thereof, and added in the ratio of oxidated silicon compound to organic components of 70:30 to 20:80 parts by weight.

4,200,698

COMPOUND AND PROCESS FOR SEALING SPACES IN ELECTRICAL INSTRUMENTS

Werner Striffeler, Winterthur, Switzerland, assignor to Micafil, AG, Zurich, Switzerland

Filed Apr. 23, 1979, Ser. No. 32,407

Claims priority, application Switzerland, Apr. 27, 1978, 4557/78

Int. Cl.[2] C08J *9/30*

U.S. Cl. 521—120 15 Claims

1. A compound for sealing spaces in electrical instruments comprising:

(a) a bromo-terminated butadiene polymer;

(b) a liquid chlorinated hydrocarbon capable of acting as a solvent for the butadiene polymer, said liquid chlorinated hydrocarbon being present in an amount ranging from about 0.3 to about 3.0 parts per part of said bromo-terminated butadiene polymer;

(c) a cross-linking agent selected from the group consisting of aliphatic polyamines and basic polyamides, said cross-linking agent being present in an amount ranging from about 0.005 to about 0.2 parts per part of the bromo-terminated butadiene polymer; and

(d) an epoxydized cycloolefin in an amount ranging from about 0.001 to about 0.1 parts per part of said liquid chlorinated hydrocarbon.

4,200,699

CATALYST COMPOSITION FOR RIGID POLYURETHANE FOAMS

Kenneth Treadwell, Rahway, N.J., assignor to M&T Chemicals Inc., Woodbridge, N.J.

Filed Oct. 12, 1978, Ser. No. 950,816

Int. Cl.[2] C08G *18/14*

U.S. Cl. 521—124 14 Claims

1. A gel catalyst composition for preparing rigid polyurethane foams, said catalyst composition consisting essentially of catalytically effective amounts of an antimony carboxylate, a potassium carboxylate and a zinc carboxylate wherein the hydrocarbyl portions of the carboxylates contain from 1 to 20 carbon atoms and wherein each of said antimony and potassium carboxylates constitutes from 10 to 40% by weight of said composition and the zinc carboxylate constitutes the remaining 20 to 80% by weight.

4,200,700

METHOD OF AFTER-FOAMING A MIXTURE OF A FOAM AND A RESIN SOLUTION

Karl Mäder, Rapperswil, Switzerland, assignor to IDC Chemie AG, Rapperswil, Switzerland

Filed May 12, 1978, Ser. No. 905,541

Claims priority, application Switzerland, May 13, 1977, 6035/77

Int. Cl.[2] C08J *9/30*

U.S. Cl. 521—186 8 Claims

1. A method of after-foaming a mixture containing a foam and a urea-formaldehyde resin solution, wherein the foam component is brought into contact with the resin component by means of a suction action, comprising directing said resin solution to a mixing chamber through an inner pipe and simultaneously directing a foam to said chamber through a concentric space defined by an outer pipe and said inner pipe, whereby an after-foaming is produced by means of the vacuum produced by said suction action and by superfluous gas present.

4,200,701

POLYMERIC MATERIALS

Raymond E. Wetton, Woodhouse Eaves, and David B. James, Norwich, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 29, 1977, Ser. No. 828,607

Claims priority, application United Kingdom, Aug. 31, 1976, 35990/76

Int. Cl.[2] C08G *65/32, 75/02, 18/82;* C08L *71/00*

U.S. Cl. 525—4 23 Claims

1. A polymeric material which comprises an amorphous solid solution formed between a metallic salt and a polymer by virtue of a multiplicity of ether, linkages present in the backbone of said polymer or in pendant groups of said polymer or both, the metal of the metallic salt being selected from the group consisting of Be, Mg, Sr, Ba, Sc, Y, Ti, V, Cr, Mn, Fe, Co, Ni, Zn, Ga, Ge, Zr, Nb, Mo, Tc, Ru, Rh, Pd, Ag, Cd, In, Sn, Sb, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Al, La and the other lanthanides.

4,200,702

SELF-EXTINGUISHING THERMOPLASTIC MOLDING COMPOSITIONS

Hermann Gausepohl, Mutterstadt; Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal, and Rudolf Stephan, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,358

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727483

Int. Cl.[2] C08L *51/00*

U.S. Cl. 525—72 3 Claims

1. A thermoplastic molding composition comprising

(A) from 6 to 100 percent by weight, based on (A+B), of a graft product manufactured by graft polymerization of

1. from 10 to 95 percent by weight, based on (A), of a mixture of styrene and acrylonitrile or an alkyl derivative thereof in the weight ratio of from 90:10 to 60:40, in the presence of

2. from 90 to 5 percent by weight, based on (A), of a rubbery polymer having a glass transition temperature of below 0° C.,

(B) from 0 to 94 percent by weight, based on (A+B), of a copolymer of styrene and acrylonitrile or an alkyl derivative thereof in the weight ratio of from 90:10 to 60:40, the content of the rubbery polymer (A 2) in the molding composition being from 5 to 40 percent by weight based on the sum of (A+B),

(C) from 5 to 30 percent by weight, based on the sum of (A+B), of one or more heat-stable brominated styrene oligomers which contain 40 to 80 percent by weight of bromine and which have a mean degree of polymerization of from 3 to 200 to act as a flameproofing agent, with or without

(D) further additives.

4,200,703

PROCESS FOR THE MANUFACTURE OF HEAT-STABLE, NUCLEAR-BROMINATED POLYSTYRENES

Klaus Diebel; Horst-Dieter Wulf; Raban Grundmann, and Gunther Maahs, all of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Marl, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 617

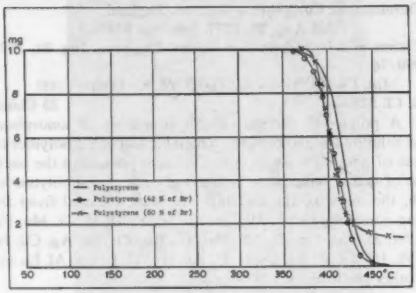
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800012; Jan. 2, 1978, 2800013

Int. Cl.[2] C08F *8/20, 8/22*

U.S. Cl. 525—357 7 Claims

1. A process for the manufacture of a heatstable, nuclear-brominated polystyrene comprising brominating, at −20° C. to +40° C., a polystyrene dissolved in a chlorinated hydrocarbon in the presence of a Lewis acid catalyst, and 0.02 to 2 moles,

per mole of Lewis acid, of a nucleophilic substance which acts as a Lewis base for the Lewis acid, the amount of Lewis base



being selected within this range such that the polystyrene is essentially not crosslinked during bromination.

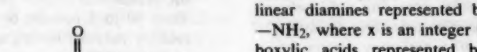
4,200,704

CONTROLLED DEGRADATION OF POLY(ETHYLENE OXIDE)

Priscilla B. Stanley, Tarrytown, and Donald F. Anderson, White Plains, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,628
Int. Cl.[2] C08G *65/32*
U.S. Cl. 525—409 **4 Claims**

1. A process for reducing the molecular weight of poly(ethylene oxide) which comprises heating a mixture of a higher molecular weight poly(ethylene oxide); from 0.1 weight percent to 5 weight percent based on the amount of said poly(ethylene oxide) of a non acid peroxide of the general formula:



wherein R and R' can be:

(a) alkyl, linear or branched, substituted or unsubstituted, having from one to forty carbon atoms; or

(b) cycloalkyl, substituted or unsubstituted, having from four to eight ring carbon atoms; or

(c) aryl, substituted or unsubstituted; or

(d) aralkyl, substituted or unsubstituted, having from seven to twenty carbon atoms;

and wherein R'' can be R or R'; a diluent which suspends the poly(ethylene oxide); and from 10 to 500 ppm based on the amount of diluent present of oxygen, at from 60° to 80° C.

4,200,705

PROCESS FOR PREPARING BLENDS OF VINYL ESTERS AND REACTIVE DILUENTS

Rhetta Q. Davis, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 897,886, Apr. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 768,308, Feb. 14, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 225
Int. Cl.[2] C08L *63/02, 61/10*
U.S. Cl. 525—482 **10 Claims**

1. In the process for preparing a curable composition of (1) a vinyl ester resin prepared from an α,β-ethylenically unsaturated carboxylic acid and a compound containing at least one oxirane group and (2) as a reactive diluent, an ester prepared from the same unsaturated carboxylic acid and an organic hydroxy compound, the improvement being a sequential process wherein said organic hydroxy compound is reacted in a first esterification with an excess of equivalents of said carboxylic acid over that required to make said reactive diluent, and after substantial completion of the esterification, introducing into the reaction mixture of reactive diluent and unreacted carboxylic acid an amount of said oxirane compound in an amount equivalent to the unreacted acid from the first esterification, and causing substantially complete reaction of said oxirane compound and said carboxylic acid in a second esterification.

4,200,706

CURING OF PHENOL-FORMALDEHYDE RESINS

Charles M. Starks, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed May 30, 1978, Ser. No. 910,820
Int. Cl.[2] C08L *61/10*
U.S. Cl. 525—502 **4 Claims**

1. A method for curing phenol-formaldehyde novalacs and resoles to highly cross-linked phenol-formaldehyde resins at temperatures of from about 25° C. to about 80° C. and pressures from about atmospheric pressure to about 5 atmospheres while using an acidic catalyst as curing agent, comprising using from about 0.05 to about 1 parts divinylbenzene per part of novalac by weight as a cross-linking agent.

4,200,707

POLYAMIDE NUCLEATED WITH ZINC PHENYL PHOSPHINATE OR ZINC PHENYL PHOSPHONATE

Paul N. Richardson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 11, 1978, Ser. No. 933,077
Int. Cl.[2] C08L *77/06*
U.S. Cl. 525—2 **5 Claims**

1. A polyamide resin consisting essentially of a blend of (a) a condensation polyamide resin made by the condensation of linear diamines represented by the formula $H_2N-(CH_2)_x-NH_2$, where x is an integer from 6 to 12, with linear dicarboxylic acids represented by the formula $HO_2C-(CH_2)_y-CO_2H$, where y is an integer between 1 and 8, and (b) zinc phenyl phosphinate or zinc phenyl phosphonate or a mixture of the two present in an amount sufficient to accelerate crystallization from a melt of the blend over a melt of the polyamide resin alone.

4,200,708

PROCESS FOR SEQUENTIALLY DISPERSING AND SAPONIFYING ETHYLENE-VINYL ACETATE COPOLYMER

Dorothee M. McClain, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,648
Int. Cl.[2] C08F *6/24, 8/12*
U.S. Cl. 525—62 **17 Claims**

1. A process for obtaining finely divided saponified ethylene-vinyl acetate copolymer particles which comprises the sequential steps of:

(a) dispersing the copolymer in an aqueous dispersion medium containing a dispersing agent for EVA copolymer under such conditions of time and/or temperature that no appreciable saponification of the dispersed copolymer can occur, the resulting dispersion being made up of particles of an average diameter of from about 20 to about 500 microns; and,

(b) saponifying the dispersed copolymer employing a strong base as the saponifying agent under such conditions of time and/or temperature that saponification to a predetermined extent is achieved.

4,200,709

GAS-SPARGING OF ETHYLENE-VINYL ESTER INTERPOLYMERS TO SUPPRESS DISCOLORATION ON ALCOHOLYSIS THEREOF

John M. Hoyt, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,960
Int. Cl.[2] C08F 8/12
U.S. Cl. 525—62 13 Claims

1. In the process for the alcoholysis of an ethylene-vinyl ester interpolymer in a reaction medium comprising as components thereof said interpolymer, a low-boiling alcohol, a hydrocarbon solvent and an alkaline or acidic catalyst, wherein the interpolymer is incorporated in the reaction medium in an amount of from about 20 to about 50 percent by weight of the hydrocarbon solvent and low-boiling alcohol the improvement of which comprises sparging the said interpolymer in solution in said solvent prior to alcoholysis with inert gas to obtain an alcoholyzed product of reduced discoloration.

4,200,710

PREPARATION OF POLYVINYLPYRROLIDONE-IODINE

Walter Denzinger, Speyer; Hans-Uwe Schenck, Wachenheim, and Wolfgang Schwarz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 30,900
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1978, 2818767
Int. Cl.[2] C08F 8/22
U.S. Cl. 525—356 4 Claims

1. A process for the preparation of PVP-iodine by reacting polyvinylpyrrolidone powder with elementary iodine at from 70° to 100° C., wherein the reaction is carried out in the presence of formic acid, oxalic acid or an ammonium salt or amide of carbonic acid, formic acid or oxalic acid.

4,200,711

PROCESS FOR PREPARING FLUORINE-CONTAINING POLYMERS HAVING CARBOXYL GROUPS

Yasuharu Onoue, Tokyo; Toshikatsu Sata, Tokuyama; Akihiko Nakahara, Tokuyama, and Junichi Itoh, Tokuyama, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Yamaguchi, Japan

Filed Apr. 21, 1978, Ser. No. 898,950
Claims priority, application Japan, Apr. 25, 1977, 52/46861; Dec. 19, 1977, 52/152694
Int. Cl.[2] C08F 8/06
U.S. Cl. 525—387 13 Claims

1. A process for preparing a fluorine-containing polymer having carboxyl groups, which comprises subjecting a fluorine-containing polymer having sulfonyl halide groups bonded to it to an oxidation reaction in the liquid phase at a temperature of 30° to 250° C.

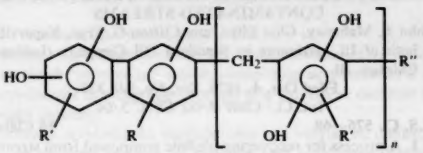
4,200,712

COATING POLYMERIZATION REACTORS WITH OLIGOMER COATINGS DERIVED FROM REACTION PRODUCTS OF SUBSTITUTED PHENOLS

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

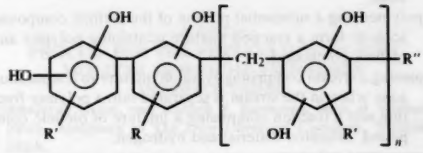
Filed Oct. 23, 1978, Ser. No. 953,713
Int. Cl.[2] C08F 2/18; B05D 7/22, 7/24
U.S. Cl. 526—62 14 Claims

1. A process for substantially eliminating the buildup of polymers on the internal surfaces of a polymerization reaction vessel which comprises applying to said surfaces an aqueous coating solution containing an oligomer having the general structure



wherein R is halogen or an alkyl group containing from 1 to 4 carbon atoms and R′ is selected from the group consisting of H, OH, halogen and an alkyl group containing from 1 to 4 carbon atoms, R″ is selected from the group consisting of H and —CH_2OH, and wherein n is an integer from 1 to 20, and conducting the polymerization of monomer(s) while in contact with the coated internal surfaces of said vessel.

12. A polymerization reaction vessel having on all the internal surfaces thereof a coating comprised of an oligomer having the general structure



wherein R is halogen or an alkyl group containing from 1 to 4 carbon atoms and R′ is selected from the group consisting of H, OH, halogen, an alkyl group containing from 1 to 4 carbon atoms, R″ is selected from the group consisting of H and —CH_2OH, and wherein n is an integer from 1 to 20.

4,200,713

PROCESS FOR THE ANIONIC HOMO- OR CO-POLYMERIZATION OF AROMATIC VINYL COMPOUNDS

Frank Wingler, Leverkusen; Clemens Casper, Krefeld, and Lothar Liebig, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 829,366, Aug. 31, 1977, abandoned. This application May 22, 1978, Ser. No. 908,340
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719972
Int. Cl.[2] C08F 4/46, 12/08
U.S. Cl. 526—64 8 Claims

1. A process for the production of a homopolymer or copolymer of an aromatic vinyl monomer which comprises anionically polymerising a monomer mixture comprising at least one aromatic vinyl monomer with an organometallic compound of one of the first three Main Groups of the Periodic Table of Elements, wherein the polymerisation reaction is carried out continuously in the absence of oxygen in a tubular coil evaporator at a temperature of −20° C. to +250° C. and with an average residence time of from 60 to 300 seconds up to a total monomer conversion of from 60 to 99.5% by weight, from 20 to 60% by weight of the aromatic vinyl compounds fed into the tubular coil evaporator per unit of time evaporating and being returned to the tubular coil evaporator after condensation.

4,200,714

OLEFIN PURIFICATION PROCESS FOR HYDROGEN CONTAMINATED STREAMS

John A. Mahoney, Glen Ellyn, and Clifton G. Frye, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 4, 1978, Ser. No. 948,333
Int. Cl.[2] C08F *6/00*; C07C *5/04*
U.S. Cl. 526—68 16 Claims

1. A process for recovering olefinic compound from streams comprising hydrogen and olefinic compounds comprising:

contacting the stream with a hydrogenation catalyst at hydrogenation conditions so as to saturate olefinic compound with hydrogen thereby forming saturated material and substantially removing hydrogen from the stream;

passing the stream comprising olefinic compound and saturated material to a semipermeable membrane separator which effectively separates the olefin from the saturated material, thereby providing a purified olefin stream.

10. An improved process for the manufacture of polymer comprising:

passing olefinic compound and hydrogen into a reaction zone;

polymerizing a substantial portion of the olefinic compound so as to form a reaction mixture containing polymer and olefinic compound;

passing a stream comprising reaction mixture to a separation zone wherein the stream is separated into a polymer fraction and a fraction comprising a mixture of olefinic compound, saturated material and hydrogen;

recovering polymer;

passing at least a portion of the mixture of olefinic compound, saturated material and hydrogen to a hydrogenation zone at hydrogenation conditions so as to hydrogenate a portion of the olefinic compound present thereby forming the saturated counterpart of the olefinic compound and substantially removing hydrogen from the mixture1

passing at least a portion of the mixture comprising olefinic compound, saturated material and saturated counterpart of the olefinic compound to a membrane separator which substantially separates olefinic compound from saturated material; and

recycling the recovered olefinic compound to the reaction zone.

4,200,715

VAPOR PHASE PROCESSES FOR THE POLYMERIZATION OF OLEFINS

Thomas J. Lynch, Houston, and Robert J. Rowatt, Orange, both of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 835,268, Sep. 21, 1977, abandoned. This application May 19, 1978, Ser. No. 907,444
The portion of the term of this patent subsequent to Jun. 19, 1996, has been disclaimed.
Int. Cl.[2] C08F *2/34, 10/02*
U.S. Cl. 526—88 13 Claims

1. In a process for the catalytic polymerization of a polymerizable olefin in the vapor phase in the presence of solid polymerization catalyst particles in a moving bed of particles of the polymerized olefin; the improvement which consists essentially of feeding the solid polymerization catalyst particles to the polymerization zone by pumping a Bingham fluid into the polymerization zone, said Bingham fluid being a solid at ambient temperature and consisting essentially of finely-divided solid polymerization catalyst particles uniformly dispersed in a continuous solid phase which consists essentially of an intimate mixture of a wax which is a solid at ambient temperature and a hydrogen which is a liquid at ambient temperature.

4,200,716

PROCESS FOR POLYMERIZING ACETYLENE

Guido Pez, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 3, 1978, Ser. No. 957,592
Int. Cl.[2] C08F *4/48, 38/02*
U.S. Cl. 526—141 10 Claims

1. A process for producing polyacetylene comprising contacting acetylene with a solution comprised of a liquid inert organic solvent and a lithium dicyclopentadienyl titanium hydride catalyst of the formula, LiRR'TiH, wherein R and R' are cyclopentadienyl rings, of the empirical formula, C_5H_5, wherein the ring hydrogens may be independently substituted with one or more groups inert toward lithium metal, said rings being bonded to titanium by sigma-bonds, pi-bonds or mixtures thereof, and said catalyst exhibiting a ^{13}C nuclear magnetic resonance spectrum in deuterated benzene in which observed values for the chemical shifts of the ring carbons in R are different from the observed values for ring carbon atoms in R', and said catalyst exhibiting an infrared spectrum in deuterated n-hexadecane in which a titanium metal-hydride absorption band is observed in the region of about 1250–1450 cm^{-1}, at a temperature at about $-120°$ to $+200°$ C., under a pressure of about 0.01 to 10 atmospheres, in the absence of elemental oxygen and water.

4,200,717

PREPARATION OF PROPYLENE POLYMER-CONTAINING SOLID TITANIUM TRICHLORIDE AND PROPYLENE POLYMERS USING SAME

Toshizo Abe; Nobuaki Goko; Yasuhiro Nishihara, and Yukimasa Matuda, all of Kurashiki, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Japan

Filed Mar. 27, 1978, Ser. No. 890,481
Claims priority, application Japan, Apr. 6, 1977, 52-39227; May 11, 1977, 52-53029
Int. Cl.[2] C08F *4/64*; B01J *31/06*
U.S. Cl. 526—159 16 Claims

1. A solid titanium trichloride catalyst containing a polymer of propylene produced by the process comprising:

(a) forming a homogeneous solution comprising titanium trichloride and an ether;

(b) heating said homogeneous solution at a temperature of lower than 150° C. to form a precipitate of solid titanium trichloride;

(c) separating said precipitate;

(d) mixing said separated precipitate, an inert solvent and an organoaluminum compound in a closed vessel; and

(e) introducing propylene into said vessel for absorption into the liquid phase in said vessel at a feed rate within the range of 1 to 10 grams per hour per gram of said solid titanium trichloride, maintaining the partial pressure of said propylene in the gaseous phase in said vessel at less than 1 kg/cm^2, the amount of propylene so introduced being controlled so that the amount of propylene absorbed is 0.1 to 50 times the weight of said solid titanium trichloride.

11. In a method of producing a propylene polymer the improvement comprising polymerizing the propylene in the presence of a catalyst admixture of (a) the propylene polymer-containing solid titanium trichloride of claim 1, and (b) an organoaluminum compound.

4,200,718

MULTIFUNCTIONAL LITHIUM CONTAINING INITIATOR

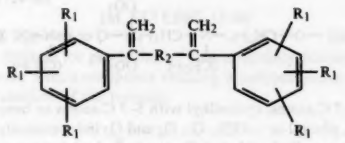
Lu H. Tung; Grace Y-S. Lo; Joseph W. Rakshys, and Douglas E. Beyer, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 702,810, Jul. 6, 1976, abandoned, which is a continuation-in-part of Ser. No. 601,577, Aug. 1, 1975, abandoned. This application Dec. 12, 1977, Ser. No. 859,356

Int. Cl.[2] C08F *4/48*

U.S. Cl. 526—173 12 Claims

1. A method for the polymerization of vinyl compounds containing at least one vinyl group and particularly vinyl hydrocarbon compounds which are polymerizable in the presence of a lithium containing catalyst, the steps of the method comprising provding a compound of the Formula:

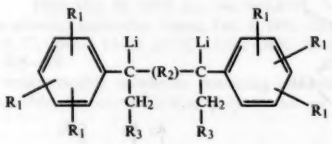


wherein $R_1$is individually selected from the group consisting of hydrogen, an alkyl hydrocarbon radical, a cycloalkyl hydrocarbon radical, alkoxy radical, and an aromatic radical with the further limitation that R_1 contains from 0 to 16 carbon atoms;

R_2 is a divalent organic radical having at least 6 carbon atoms, R_2 having at least one aromatic ring, the aromatic ring being directly attached to the carbon which is attached to the aromatic ring in the above formula with the further limitation R_2 contains carbon and hydrocarbon, and optionally oxygen or sulfur, oxygen and sulfur when present are present only in the configuration of a diphenyl oxide or diphenyl sulfide, and a lithium containing compound of the Formula:

R_3Li

R_3 is selected from the group consisting of alkyl, cycloalkyl, and aromatic radicals containing from 1 to 20 carbon atoms, to provide a multifunctional lithium compound having the Formula:



subsequently contacting the resultant dispersion with at least one lithium polymerizable monomer to cause the polymerization thereof.

4,200,719

METHOD OF PRODUCTION OF ACRYLONITRILE POLYMER WITH VINYLBENZYL SULFONIC ACIDS

Kaoru Yamazaki, Akashi; Shunichiro Kurioka; Takashi Hatano, both of Kobe; Sadame Asada, Takasago, and Mariko Yasuda, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 683,814, Jul. 6, 1976, abandoned. This application Dec. 22, 1977, Ser. No. 863,529

Claims priority, application Japan, May 7, 1975, 50-55228

Int. Cl.[2] C08F *2/16, 228/02*

U.S. Cl. 526—220 6 Claims

1. A method of producing a copolymer comprising 50 to 65 weight percent acrylonitrile and mainly vinylchloride and vinylidene chloride in amounts defined by the formula

$$102.8 < A + B + 1.29C < 107.4$$

wherein A is a mixture of olefinic monomers excluding B and C in weight percent and mainly comprising acrylonitrile, B is vinylchloride in weight percent and C is vinylidene chloride in weight percent;

wherein acrylonitrile, vinylchloride and vinylidene chloride in amounts suitable to produce said copolymer having constituent amounts within the range set forth in the above formula are polymerized in an aqueous solution containing 45 to 65 weight percent concentration of dimethyl formamide and in the presence of 0.20 to 8.0 weight percent of at least one monomer selected from m- and p- vinyl benzyl sulfonic acid, 2-chlor-4-vinyl benzyl sulfonic acid and sodium, potassium and ammonium salts of the aforementioned sulfonic acids with good stability of latex at yields of not less than 90%.

4,200,720

PROCESS FOR THE PREPARATION OF LOW MOLECULAR WEIGHT ANHYDRIDE INTERPOLYMERS

Syamalarao Evani, and Russell J. Raymond, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 849,281, Nov. 7, 1977. This application Aug. 24, 1978, Ser. No. 936,534

The portion of the term of this patent subsequent to Dec. 25, 1996, has been disclaimed.

Int. Cl.[2] C08F *2/38, 222/04, 222/06, 222/08*

U.S. Cl. 526—233 12 Claims

1. In a process for preparing a low molecular weight polymer comprising polymerizing at least one unsaturated dicarboxylic acid anhydride monomer with at least one copolymerizable monomer in an organic solvent in which the monomers and the polymer are soluble and in the presence of a free radical catalyst, the improvement which comprises polymerizing the monomers in the presence of the hydroxide or a nucleophilic salt of a monovalent cation selected from the group consisting of sulfonium cations, phosphonium cations, the ammonium cation, protonated primary, secondary or tertiary amines, quaternary ammonium cations and alkali metal cations.

4,200,721

HEAT RESISTANT POLYMERS OF OXIDIZED STYRYLPHOSPHINE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Kazimiera J. L. Paciorek, Corona Del Mar, Calif.

Division of Ser. No. 706,424, Jul. 19, 1976, Pat. No. 4,092,466. This application May 19, 1978, Ser. No. 907,479

Int. Cl.[2] C08F *26/00;* C08C *19/22;* C08F *30/02, 230/02*

U.S. Cl. 526—261 15 Claims

1. A batch thermal polymerization process for preparing homopolymers, copolymers and terpolymers of oxidized styrylphosphine monomers, which comprises:

polymerizing in batch at a temperature of 130° to 230° C. at least one oxidized styrylphosphine monomer selected from the group consisting of:

$(C_6H_5)_2P(O)N{=}P(C_6H_5)_2C_6H_4CH{=}CH_2$,

$(C_6H_5O)_2P(O)N{=}P(C_6H_5)_2C_6H_4CH{=}CH_2$,

$(C_6H_5)_2C_3N_3N{=}P(C_6H_5)_2C_6H_4CH{=}CH_2$ and

$(C_6H_5)C_3N_3[N{=}P(C_6H_5)_2C_6H_4CH{=}CH_2]_2$.

4,200,722

RUBBER-LIKE COPOLYMERS OF ETHYLENE, AT LEAST ONE OTHER α-ALKENE AND ONE OR MORE POLYENES POSSESSING INCREASED BUILDING TACK

Albertus J. Pennings, Norg, and Arnold Vossebeld, Beek, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 411,402, Oct. 31, 1973, abandoned, which is a continuation-in-part of Ser. No. 381,091, Jul. 20, 1973, abandoned, which is a continuation of Ser. No. 291,163, Sep. 22, 1972, abandoned. This application Nov. 19, 1976, Ser. No. 743,339

Claims priority, application Netherlands, Sep. 24, 1971, 7113143; Sep. 24, 1971, 7113144

Int. Cl.[2] C08F *210/18, 232/06, 236/00*

U.S. Cl. 526—282 11 Claims

1. A rubbery copolymer of 20 to 75 percent by weight of ethylene, about 24 to about 79 percent by weight of at least one other α-alkene having from 3 to 8 carbon atoms, and from about 0.1 to 10 percent by weight of one or more dienes, the total of said monomers amounting to 100 percent by weight, said rubbery copolymer having a thermogram recorded by differential scanning calorimetry (d.s.c.) at a cooling rate of 8° C. per minute and showing the heat of crystallization as a function of temperature having a peak which passes through a maximum at a temperature between −7° and +11° C.

4,200,723

ORGANIC PHENOL EXTRACT COMPOSITIONS OF PEANUT HULL AGRICULTURAL RESIDUES AND METHOD

Chia-Ming Chen, 205 Dove Valley Dr., Athens, Ga. 30606

Division of Ser. No. 922,101, Jul. 5, 1978, which is a continuation-in-part of Ser. No. 814,920, Jul. 12, 1977. This application Aug. 8, 1978, Ser. No. 931,889

Int. Cl.[2] C08G *83/00*

U.S. Cl. 528—1 27 Claims

1. Phenolic compounds and protein containing extract composition consisting essentially of that portion of peanut hulls that has been reacted with an aqueous alkaline solution to form a water-soluble or water-suspendible composition containing phenolic compounds and at least 2% by weight of crude protein, based upon 100% by weight of total extracted organic substances.

4,200,724

POLYMER CONTAINING IMIDYL GROUPS AND SILYL GROUPS

Roland Darms, Therwil, and Siegfried Wyler, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

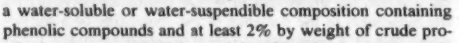
Filed Aug. 30, 1978, Ser. No. 938,168

Claims priority, application Switzerland, Sep. 9, 1977, 11069/77

Int. Cl.[2] C08G *77/04*

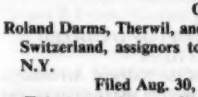
U.S. Cl. 528—26 13 Claims

1. A compound of the formula I



(I)

in which Y_1 and Y_2 independently of one another are a



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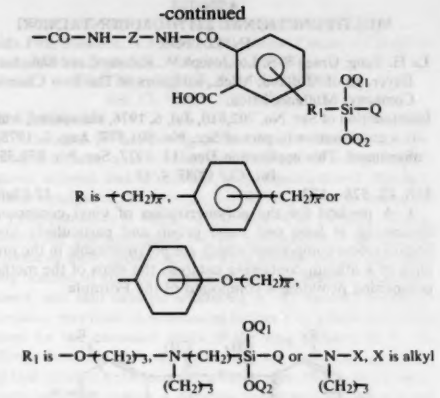
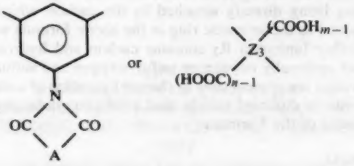
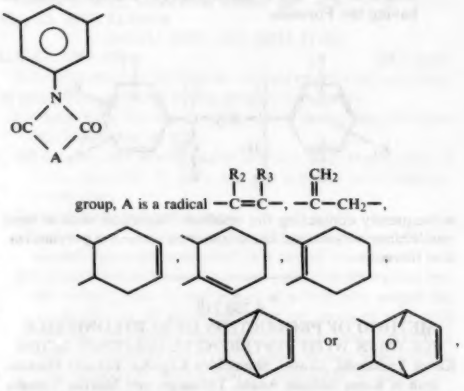


with 2–7 C atoms, cycloalkyl with 5–7 C atoms or benzyl, Q is methyl, phenyl or $—OQ_3$, Q_1, Q_2 and Q_3 independently of one another are alkyl with 1–6 C atoms or phenyl, x is an integer from 2 to 4, a is an integer from 1 to 50, the individual radicals Z independently of one another are an aliphatic radical with at least 2 C atoms, or a cycloaliphatic, araliphatic, carbocyclic-aromatic or heterocyclic-aromatic radicals and Z_1 and the individual radicals Z_2 independently of one another are a



group, but at least one of Z_1 and Z_2 is a



R_2 and R_3 independently of one another are hydrogen or methyl, the individual values m and n independently of one another are 1 or 2 and the individual radicals Z_3 independently of one another are an aliphatic radical with at least 2 C atoms, or a cycloaliphatic, carbocyclic-aromatic or heterocyclic-aromatic radical, in which the carboxamide and carboxyl groups are bonded to different C atoms and carboxyl groups

bonded to cyclic radicals Z_3 are each in the ortho-position to a carboxamide group, and the corresponding cyclised imide derivative.

4,200,725

METHOD OF PRODUCING BLOCKED POLYISOCYANATES BY REACTION OF AN IMIDAZOLINE WITH AN ISOCYANATE

Rainer Gras, Herne; Johann Obendorf, Dorsten, and Elmar Wolf, Herne, all of Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Marl, Fed. Rep. of Germany

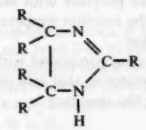
Filed Jun. 30, 1978, Ser. No. 921,091

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1977, 2729704

Int. Cl.[2] C08G *18/80*

U.S. Cl. 528—49 24 Claims

1. A method for producing at least a partially blocked polyisocyanate which comprises reacting a polyisocyanate with a cyclic amidine of the formula



wherein each R may be the same or different substituent selected from the group consisting of hydrogen, alkyl, cycloalkyl, alkaryl, aralkyl, heterocyclic and aryl, and wherein R is inert to isocyanate groups at a temperature of 0°–150° C.

4,200,726

SEMIPERMEABLE MEMBRANE OF PHENOXY RESIN CONTAINING SULFURIC ACID GROUPS OR SALTS THEREOF

Kiyoshi Ishii; Ryoshu Suzuki; Zenjiro Honda, and Hitoshi Tsugaya, all of Saitama, Japan, assignors to Daicel Ltd., Osaka, Japan

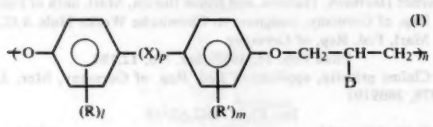
Filed May 30, 1978, Ser. No. 910,877

Claims priority, application Japan, Jun. 1, 1977, 52-64427

Int. Cl.[2] B01D *13/00, 13/02, 13/04;* C08G *65/40*

U.S. Cl. 528—99 12 Claims

1. A semipermeable membrane consisting essentially of a water-insoluble, membrane-forming polymer having the formula



(I)

wherein R and R′ are halogen, nitro, methyl or ethyl, X is a divalent group selected from the group consisting of methylene, ethylene, isopropylidene, ether (—O—), carbonyl (—CO—), sulfide (—S—), sulfoxide (—SO—) and sulfone ($—SO_2—$), l and m are integers of from 0 to 4, p is 0 or 1, and n is an integer of from 100 to 1000,

and wherein from 15 to 90% of said D groups are sulfuric acid groups or salts thereof with an alkali metal, ammonia or a nitrogen-containing basic organic compound, and the balance of said D groups are hydroxyl groups.

4,200,727

MANUFACTURE OF POLYETHERS FROM BISPHENOLS AND DIHALIDES IN THE ABSENCE OF SOLVENT AND IN THE PRESENCE OF ALKALI METAL CARBONATE

Gerd Blinne, Bobenheim, and Claus Cordes, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1978, Ser. No. 952,800

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749645

Int. Cl.[2] C08G *65/40*

U.S. Cl. 528—125 6 Claims

1. A process for the manufacture of a polyether by polycondensing substantially equivalent amounts of a bisphenol or of a mixture of several bisphenols and of a dihalobenzene compound or a mixture of several dihalobenzene compounds in the presence of from 1.0 to 2.2 moles of an anhydrous alkali metal carbonate, wherein the polycondensation is carried out in the melt, in the absence of a solvent or diluent at a temperature of from 200° to 400° C.

4,200,728

MANUFACTURE OF POLYETHERS FROM BIS-(4-HYDROXYPHENYL)-SULFONE AND BIS-(4-CHLOROPHENYL)-SULFONE IN N-METHYLPYRROLIDONE USING AN ALKALI METAL CARBONATE AS CATALYSTS

Gerd Blinne, Bobenheim, and Claus Cordes, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,176

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1977, 2731816

Int. Cl.[2] C08G *65/40*

U.S. Cl. 528—174 5 Claims

1. A process for the manufacture of polyethers by reacting substantially equivalent amounts of bis-(4-hydroxyphenyl)-sulfone with bis-(4-chlorophenyl)-sulfone in the solvent N-methylpyrrolidone in the presence of an anhydrous alkali metal carbonate, wherein

(a) in a first stage of the reaction a solution of one mole of bis-(4-hydroxyphenyl)-sulfone is reacted with about one mole of bis-(4-chlorophenyl)-sulfone in the presence of from 1 to 2 moles of an anhydrous alkali metal carbonate and in the presence of a compound which forms an azeotrope with water, at an average temperature of from 100° C. to 170° C., until at least 90% of the amount of water which can theoretically be formed has been removed,

(b) in a second stage of the reaction, further amounts of the compound which forms an azeotrope are added to the reaction mixture while raising the temperature to an average temperature of from 150° C. to 230° C., and at the same time the azeotropic mixture formed is distilled off, until the reaction mixture is completely anhydrous,

(c) in a third stage of the reaction, the reaction mixture is polycondensed at an average temperature of from 150° C. to 230° C. until its reduced viscosity is from 0.4 to 1.5 and the polymerization is then stopped by adding methyl chloride and

(d) the polyether formed is separated from the solvents and inorganic constituents.

4,200,729

CURING AMINO RESINS WITH AROMATIC SULFONIC ACID OXA-AZACYCLOPENTANE ADDUCTS

Leonard J. Calbo, Bethel, Conn., assignor to King Industries, Inc, Norwalk, Conn.

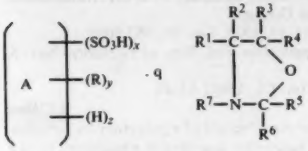
Filed May 22, 1978, Ser. No. 908,358

Int. Cl.[2] C08L *61/32*

U.S. Cl. 525—398 26 Claims

1. A composition comprising a convertible amino resin

selected from the group consisting of amino- or imino-group containing compounds condensed with an aldehyde, dialdehyde and aldehyde precursor and a catalytically effective amount of a thermally-decomposable adduct of an aromatic sulfonic acid, said adduct being of the general formula:



wherein A is phenyl or naphthyl and x is a whole number of from 1 to 8, y is a whole number of from 0 to 7, the sum of x and y being no greater than 8, and z is 8-x-y when A is naphthyl and 6-x-y when A is phenyl; q is a positive number equal to or greater than about 0.5; R is alkyl, halogen, haloalkyl or alkoxy; and R^1, R^2, R^3, R^4, R^5, R^6 and R^7, independently, are hydrogen, alkyl, halogen, haloalkyl or alkoxy.

4,200,730

CHEMICAL MODIFICATION OF MICROSCOPIC OPACIFYING PARTICLES

Ronald Golden, Louisville, Ky., assignor to Champion International Corporation, Stamford, Conn.

Filed Dec. 1, 1978, Ser. No. 965,323

Int. Cl.[2] C08G *14/02*

U.S. Cl. 525—398 **14 Claims**

1. In a process for the preparation of substantially spherical, opacifying particles, which process comprises admixing an aqueous, partially condensed, aldehyde condensation product with an oily material and a surface-active emulsifying agent to form a water-in-oil emulsion, admixing an amphiphilic acid catalyst with said emulsion and polymerizing said aldehyde condensation product in a polymerization zone to form substantially spherical, polymerized particles, the improvement comprising reacting a modifying agent with said aldehyde condensation product, said modifying agent being capable of imparting cationic-, anionic- or free hydroxy-functional groups to said aldehyde condensation product, said modifying agent being added to the system subsequent to the formation of said water-in-oil emulsion.

4,200,731

ENDCAPPED POLYESTERS

Fred L. Massey, Uniontown, and Trent A. Sponseller, Hartville, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 1, 1979, Ser. No. 8,639

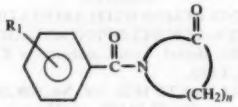
Int. Cl.[2] C08G *63/20*

U.S. Cl. 525—437 **20 Claims**

1. A process for endcapping a polyester, comprising the steps of:

adding an endcapping compound to the polyester,

said endcapping compound selected from the class consisting of



and

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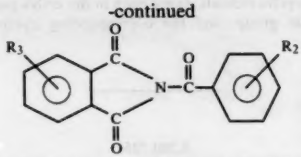


where R_1, R_2 and R_3 are selected from the class consisting of hydrogen, a halide, an alkyl, an aryl, and an alkyl substituted aryl, and wherein n is 2 to 14, said halide selected from the class consisting of fluorine, chlorine, iodine and bromine, said alkyl having from 1 to 8 carbon atoms, said aryl having from 6 to 14 carbon atoms, said alkyl substituted aryl having from 5 to 15 carbon atoms,

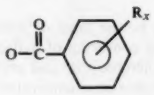
said polyester having at least one hydroxyl end group,

the amount of said endcapping compound ranging from about 0.1 to about 3.0 equivalents per said hydroxyl end group,

mixing said polyester polymer with said endcapping compound,

heating said polyester polymer with said endcapping compound to at least the reaction temperature of said endcapping compound, and

reacting said endcapping compound with said hydroxyl end group of said polyester so that said polyester contains an end group having the structure



where R_x is said R_1 or said R_2.

4,200,732

PROCESS FOR PREPARING VERY VISCOUS HEAT STABLE POLY(BUTYLENE TEREPHTHALATE)

Gernot Horlbeck, Haltern, and Klaus Burzin, Marl, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls A.G., Marl, Fed. Rep. of Germany

Filed Feb. 14, 1979, Ser. No. 12,184

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1978, 2809101

Int. Cl.[2] C08G *63/18*

U.S. Cl. 528—274 **8 Claims**

1. In a process for preparing very viscous, heat-stable poly(-butylene terephthalate) by condensing terephthalic acid or a lower alkyl ester thereof, with 1,4-butanediol in two stages at an elevated temperature and in the presence of conventional catalysts, the improvement which comprises carrying out the condensation in the presence of 0.5 to 15 mole %, relative to the number of moles of terephthalic acid units, of 9,10-dihydro-9,10-[cis-11,12-bis-(hydroxymethyl)-ethano]-anthracene.

6. The poly(butylene terephthalate) produced by the process of claim **1**.

4,200,733

IODINE-CONTAINING BLOCK COPOLYMERS OF 1,4-BUTYLENE OXIDE AND ETHYLENE OXIDE

Johannes Perner, Neustadt; Norbert Greif, Bobenheim; Rolf Fikentscher, Ludwigshafen, and Paul Diessel, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 25,174

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817785

Int. Cl.[2] C08L *71/02;* C08G *65/32*

U.S. Cl. 528—417 3 Claims

1. An iodine-containing block copolymer which contains from 5 to 25% by weight of bonded iodine, which is combined with an iodine-free compound of the formula I

$$R(AB)_z \qquad I$$

where

if z=1, R is hydrogen or a C_1-C_{18}-aliphatic hydrocarbon radical,

if z≠1, R is a z-valent aliphatic hydrocarbon radical of 2 to 8 carbon atoms, or a divalent aliphatic hydrocarbon radical of 2 to 8 carbon atoms which carries up to z ethylene oxide units,

z is from 1 to 6,

A is a polymer or copolymer block of from 4 to 100 1,4-butylene oxide units and from 0 to 25 ethylene oxide units and

B is a polymer or copolymer block of from 0 to 50 1,4-butylene oxide units and from 1 to 100 ethylene oxide units, the proportion of 1,4-butylene oxide being > 50 mole % in A and < 50 mole % in B.

4,200,734

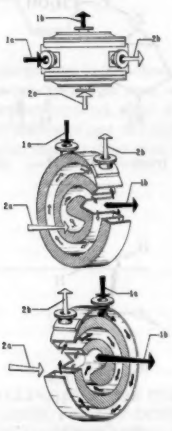
PROCESS FOR POLYMERIZATION OF POLYVINYL CHLORIDE AND VCM MONOMER REMOVAL

Dale R. Muehlenbrock, Pasadena; John R. Prihoda, Houston, and Leonard Singleton, Jr., Baytown, all of Tex., assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Nov. 21, 1977, Ser. No. 853,527

Int. Cl.[2] C08F *6/00, 6/10, 6/24*

U.S. Cl. 528—503 3 Claims



1. In the process of suspension polymerization of polyvinyl chloride homopolymers and copolymers of vinyl chloride and other comonomers wherein at least 75 percent of the monomer units are vinyl chloride, said process including a step wherein a raw polyvinyl chloride slurry is fed from a raw slurry holding means to a vinyl chloride monomer stripping column in which it flows downward over a series of trays while subjected to a combination of steam and pressure/vacuum conditions; the improvement which comprises first passing said raw polyvinyl chloride resin slurry at a temperature of from about 70° to about 115° F. to the cold inlet port of a spiral heat exchanger which has a minimum channel width of about 0.1 inch, then passing the raw polyvinyl chloride slurry outflow from the heat exchanger to said stripping column at a temperature of from about 150° to about 170° F.; removing an outflow stream of stripped polyvinyl chloride slurry from said stripping column at a temperature of from about 150° to about 200° F., then splitting said stripped outflow stream into two substreams, a first substream which is passed to the hot feed inlet port of said heat exchanger and a second substream which is fed directly to means where it is dried and finished, the flow rate of said second substream exceeding the flow rate of raw polyvinyl chloride suspension resin slurry into said stripping column; and wherein the outflow of the stripped polyvinyl chloride suspension resin slurry exits from said heat exchanger at a temperature of from about 90° to about 130° F. and is recycled to the bottom of said stripping column.

4,200,735

CELLULOSIC ION EXCHANGE FIBERS AND METHOD FOR PREPARING SAME

Takezo Sano, Takatsuki, and Ichiki Murase, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

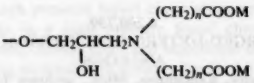
Filed Feb. 26, 1979, Ser. No. 15,217

Claims priority, application Japan, Mar. 6, 1978, 53/25877

Int. Cl.[2] C08B *15/06*

U.S. Cl. 536—30 16 Claims

1. A cellulosic ion-exchange fiber having a functional group represented by the formula,



wherein n is 1 or 2 and M is a hydrogen atom, alkali metal or ammonium residue.

4,200,736

PREPARATION OF WATER-INSOLUBLE CARBOXYMETHYL CELLULOSE ABSORBENTS

Makoto Shinohara, Ringwood, and Nathan D. Field, Wyckoff, both of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Filed May 17, 1978, Ser. No. 906,723

Int. Cl.[2] C08B *11/20*

U.S. Cl. 536—87 8 Claims

1. A process for the preparation of substantially water-insoluble, particulate carboxymethyl cellulose, which comprises heating a solid, water-soluble, particulate sodium carboxymethyl cellulose having a degree of substitution of at least 0.4 at temperatures in excess of 100° C. and in the presence of carbon dioxide gas, to thereby substantially insolubilize the carboxymethyl cellulose, the thus insolubilized carboxymethyl cellulose exhibiting a swell ratio of from 5 to 50.

4,200,737

PREPARATION OF WATER-INSOLUBLE CARBOXYMETHYL CELLULOSE ABSORBENTS

Herman L. Marder, Plainfield; Nathan D. Field, Wyckoff, and Makoto Shinohara, Ringwood, all of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Filed May 17, 1978, Ser. No. 906,724

Int. Cl.[2] C08B *11/20*

U.S. Cl. 536—87 7 Claims

1. A process for the preparation of substantially water-insoluble, particulate carboxymethyl cellulose, which com-

prises treating a solid, water-soluble particulate sodium carboxymethyl cellulose having a degree of substitution of at least 0.4 with hydrogen chloride gas, and heating the carboxymethyl cellulose at temperatures in excess of 100° C. to convert the same to a partially acid form, cross-linked and substantially insolubilized material exhibiting a swell ratio of from 5 to 50.

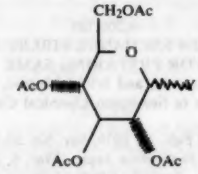
4,200,738

METHOD FOR PREPARING AURANOFIN

David T. Hill, North Wales; Blaine M. Sutton, Hatboro, both of Pa., and Ivan Lantos, Blackwood, N.J., assignors to Smith-Kline Corporation, Philadelphia, Pa.

Filed Apr. 21, 1977, Ser. No. 789,602
Int. Cl.[2] C07H *23/00*
U.S. Cl. 536—121 **4 Claims**

1. The method of preparing auranofin comprising reacting a S-(triethylphosphineaurous) thiouronium salt with a compound of the structure:



in which Ac is acetyl and Y is bromo, chloro, tosyloxy, brosyloxy, mesyloxy or trifluoromethanesulfonyloxy, in an alkaline media in which the reactants are solubie.

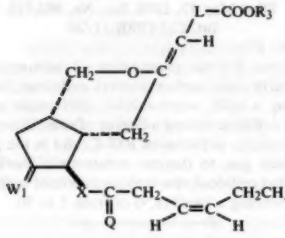
4,200,739

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,777, Aug. 23, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,392
Int. Cl.[2] C07D *311/02*
U.S. Cl. 542—426 **17 Claims**

1. A 5E compound of the formula



wherein W_1 is α—OH:β—H, α—H:β—OH, oxo, methylene, α—H:β—H, α—CH_2OH:β—H;
wherein L is
(1) —$(CH_2)_d$—$C(R_2)_2$,
(2) —CH_2—O—CH_2—Y—, or
(3) —CH_2CH=CH—,
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, —CH_2— or —$(CH_2)_2$—,
wherein Q is oxo, α—H:β—H, α—OH:β—R_8 or α—R_8-:β—OH
wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_3 is
(a) hydrogen,
(b) alkyl of one to 12 carbon atoms, inclusive,
(c) cycloalkyl of 3 to 10 carbon atoms, inclusive,
(d) aralkyl of 7 to 12 carbon atoms, inclusive,
(e) phenyl,
(f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,
(g) p-[p-(acetamido)benzamido]phenyl,
(h) p-benzamidophenyl,
(i) p-acetamidophenyl,
(j) p-phenylurea,
(k) p-benzaldehyde semicarbazone,
(l) β-naphthyl,
(m) $CH(R_{11})$—CO—R_{10},
wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2 naphthyl, and wherein R_{11} is hydrogen or benzoyl, or
(n) a pharmacologically acceptable cation;
wherein X is
(1) trans—CH=CH—,
(2) cis—CH=CH—,
(3) —C≡C—, or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

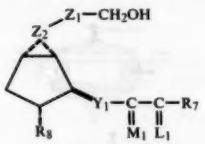
4,200,740

2-DECARBOXY-2-HYDROXYMETHYL-TRANS-4,5-DIDEHYDRO-PGI$_1$ COMPOUNDS

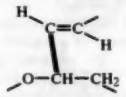
Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,542, Aug. 3, 1977. This application Aug. 31, 1978, Ser. No. 938,546
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—426 **82 Claims**

1. A prostacyclin analog of the formula

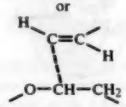


wherein Y_1 is trans—CH=CH—, cis—CH=CH—, or —CH_2CH_2—;
wherein Z_2 is



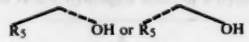
(1)

or



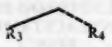
(2)

wherein Z_1 is
(1) —$(CH_2)_g$—CH_2—CH_2—, or
(2) —$(CH_2)_g$—CH_2—CF_2—,
wherein g is the integer zero, one, or 2;
wherein R_8 is hydrogen, hydroxy, or hydroxymethyl;
wherein M_1 is



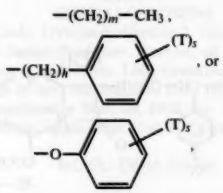
wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive; and
wherein L_1 is

or a mixture of



and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein R_7 is



(1)
(2)
(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

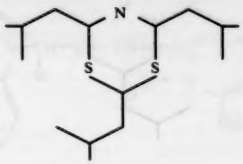
4,200,741

USE OF CRYSTALLINE PURE OR SUBSTANTIALLY PURE 2,4,6-TRI-ISOBUTYL-1,3,5-DITHIAZINE AND PROCESS FOR PREPARING SAME

Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Nov. 17, 1978, Ser. No. 961,684
Int. Cl.[2] C07D *285/00*
U.S. Cl. 544—5 2 Claims

1. A process for producing pure crystalline or substantially pure 2,4,6-tri-isobutyl-1,3,5-dithiazine having the structure:



comprising, in sequential order, the steps of:

(i) reacting ammonia with isovaleraldehyde in order to form a Shiff Base at a temperature of between −15° C. and 0° C., the mole ratio of ammonia:isovaleraldehyde being between 2:1 and 1:0.5;

(ii) reacting said Shiff Base with hydrogen sulfide at room temperature and at atmospheric pressure over a period of time of between 1 and 5 hours thereby forming a reaction mixture;

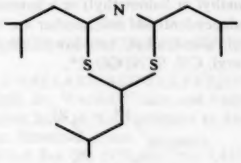
(iii) extracting the reaction mixture with an inert organic solvent, drying the extract-solvent mixture and evaporating the solvent therefrom;

(iv) distilling the resulting crude material in order to remove low boiling fractions at under 0.5 mm Hg pressure and continuing distillation until the temperature of the residue reaches 120° C.;

(v) subjecting the extracted material to column chromatography whereby selected column chromatography fractions are formed, using isopentane and diethyl ether solvents whereby selected column chromatography fractions are formed;

(vi) subjecting said selected column chromatography fractions to high pressure liquid chromatography at 350 ml per minute in a high pressure liquid chromatography column using diethyl ether and isopentane solvents; and

(vii) obtaining selected high pressure liquid chromatography fractions and selecting those fractions which contain substantially pure or 100% pure crystalline 2,4,6-tri-isobutyl-1,3,5-dithiazine having the structure:



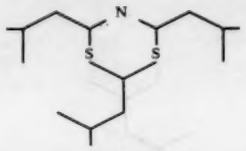
4,200,742

CRYSTALLINE PURE 2,4,6-TRI-ISOBUTYL DIHYDRO-1,3,5-DITHIAZINE

Chi-Kuen Shu, Cliffwood; Braja D. Mookherjee, Holmdel, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 961,684, Nov. 17, 1978. This application Feb. 9, 1979, Ser. No. 10,887
Int. Cl.[2] C07D *285/00*
U.S. Cl. 544—5 1 Claim

1. Pure crystalline 2,4,6-tri-isobutyl-dihydro-1,3,5-dithiazine having the structure:



4,200,743

PREPARATION OF 1-CYANO-2,1,3-BENZOTHIADIAZINONES

Friedrich Linhart, Heidelberg; Gerd Stubenrauch, Ludwigshafen, and Gerhard Hamprecht, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

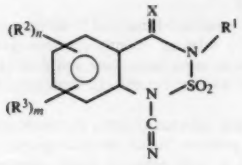
Filed May 31, 1979, Ser. No. 44,030

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1978, 2832404

Int. Cl.[2] C07D *285/16*

U.S. Cl. 544—11 1 Claim

1. A process for the preparation of a 1-cyano-2,1,3-benzothiadiazin-4-one-2,2-dioxide of the general formuala I

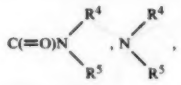


I

where

R^1 is alkyl, haloalkyl, cycloalkyl, alkenyl, alkynyl, haloalkenyl, halogenoalkynyl, alkoxyalkyl, alkylmercaptoalkyl, alkylcarbamoylalkyl and dialkylcarbamoylalkyl, alkoxycarbonyl, alkoxycarboalkyl, alkoxycarboalkenyl, alkanoylalkyl, aryl (which is unsubstituted or is substituted by halogen, methyl or halomethyl) or a heterocyclic ring,

R^2 and R^3 independently of one another are halogen, nitro, lower alkyl, alkoxyalkyl, halo-lower alkyl, cycloalkyl, arylalkyl, aryl, CN, SCN, CO_2R^4,



YR^5, SO_2R^4, SO_2OR^4,

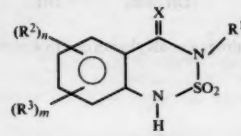
$(C{=}O)R^4$ or $Y'CF_2C(Z)_3$,

R^4 and R^5 independently of one another are unsubstituted or halogen-, methyl- or nitro-substituted lower alkyl or aryl,

X, Y and Y' independently of one another are oxygen or sulfur,

each Z, independently of the others, is hydrogen or halogen and

n amd m independently of one another are integers from 0 to 4, but m+n is not greater than 4, wherein an about equimolar amount of an inorganic cyanide, dissolved in water, is added to a mixture of bromine and water, an aqueous solution of an at most equimolar amount of a salt of a 2,1,3-benzothiadiazin-4-one-2,2-dioxide of the formula II



II

where R^1, R^2, R^3, n, m and X have the above meanings, and of a base is then added, the batch is mixed thoroughly and the resulting end product is isolated from the mixture.

4,200,744

SUBSTITUTED 7α-METHOXY-7β[(2,3-DIOXO-1-PIPERAZINYL)CARBONYLAMINOPHENYLACETAMIDO]CEPHALOSPORINS

Isamu Saikawa; Shuntaro Takano; Hiroyuki Imaizumi; Isamu Takakura; Hirokazu Ochiai; Takashi Yasuda; Hideo Taki; Masuru Tai, and Yutaka Kodama, all of Toyama, Japan, assignors to Toyama Chemical Company, Limited, Tokyo, Japan

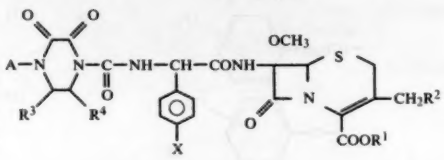
Continuation-in-part of Ser. No. 759,134, Jan. 13, 1977, Pat. No. 4,129,730. This application Oct. 27, 1977, Ser. No. 845,935

Claims priority, application Japan, Jul. 21, 1977, 52-86613; Jul. 21, 1977, 52-87540

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—21 12 Claims

1. A 7α-methoxy-cephalosporin represented by the formula:



wherein R^1 is a hydrogen atom or a pharmaceutically acceptable salt-forming cation; R^2 is a substituted or unsubstituted heterocyclic thio group in which the thio linkage is attached to a carbon atom of a 5 or 6 membered aromatic heterocyclic ring composed of carbon and at least one hetero atom selected from oxygen, sulfur and nitrogen, the heterocyclic moiety of said heterocyclic thio group being composed of said aromatic heterocyclic ring or of said aromatic heterocyclic ring fused to a benzene ring or being triazolopyridyl or purinyl, there being up to three substituents in the substituted group, the substituents being selected from halogen, hydroxyl, alkyl having 1 to 13 carbon atoms, alkyloxy having 1 to 5 carbon atoms, hydroxyalkyl having 1 to 5 carbon atoms, alkylthio having 1 to 5 carbon atoms, alkylamino having 1 to 5 carbon atoms, dialkylamino having 1 to 5 carbon atoms in each alkyl, alkanoylamino having 2 to 5 carbon atoms, alkanoyl having 2 to 5 carbon atoms, alkanoyloxy having 2 to 5 carbon atoms, N,N-dialkylaminoalkyl having 1 to 5 carbon atoms in each alkyl, alkyloxyalkyl having 1 to 5 carbon atoms in each alkyl, carboxyalkyl having 2 to 6 carbon atoms, sulfoalkyl having 1 to 5 carbon atoms, sulfamoylalkyl having 1 to 5 carbon atoms, carbamoylalkyl having 1 to 5 carbon atoms, phenyl, naphthyl, nitro,, cyano, carboxyl, carbamoyl, sulfo, sulfamoyl and oxo; R^3 and R^4 are independently a hydrogen atom or a lower alkyl group; A is a singly substituted or unsubstituted alkyl group having 1 to 13 carbon atoms, the substituent on said substituted alkyl group being selected from halogen, hydroxyl, alkyloxy having 1 to 5 carbon atoms, alkylthio having 1 to 5 carbon

atoms, nitro, cyano, carboxyl and alkanoyl having 2 to 5 carbon atoms; and X is a hydrogen atom or a hydroxyl group.

4,200,745

7[2-(2-AMINOTHIAZOL-4-YL)-2-ALKOXYIMINO]ACETAMIDO 3[4-ALKYL-5-OXO-6-HYDROXY-3,4 DIHYDRO 1,2,4-TRIAZIN 3-YL]THIO METHYL CEPHALOSPORINS

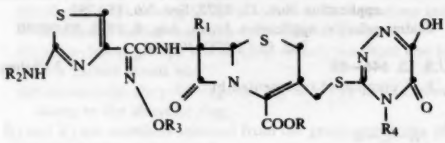
Allen S. Katner, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 20, 1977, Ser. No. 862,318

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—21 **12 Claims**

1. A compound of the formula



wherein in the above formula

R is hydrogen, an alkali metal cation, or a carboxylic acid protecting group;

R_1 is hydrogen or methoxy;

R_2 is hydrogen or an amino protecting group;

R_3 is hydrogen or C_1–C_4 alkyl; and

R_4 is C_1–C_4-alkyl.

4,200,746

CEPHALOSPORINS

Martin C. Cook, Liverpool; Gordon I. Gregory, Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories, Ltd., Greenford, England

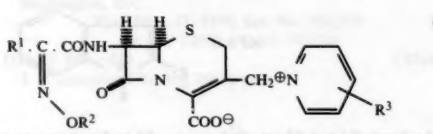
Continuation of Ser. No. 642,300, Dec. 19, 1975, abandoned. This application Mar. 20, 1978, Ser. No. 888,242

Claims priority, application United Kingdom, Dec. 20, 1974, 55213/74

Int. Cl.[2] C07D *501/20*

U.S. Cl. 544—25 **16 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic of the formula



(I)

where R^1 represents a furyl or thienyl group; R^2 represents a C_1–C_4 alkyl group, a C_3–C_7 cycloalkyl group, a furylmethyl group or a thienylmethyl group; and R^3 represents a hydrogen atom or a carbamoyl, carboxy, carboxymethyl, sulpho or methyl group, and a physiologically acceptable salt, ester or 1-oxide thereof.

4,200,747

7-2-INDOLYL ACETAMIDO CEPHALOSPORIN DERIVATIVES

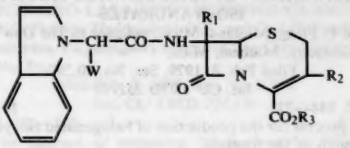
Abraham Nudelman, Rehovot, and Abraham Patchornik, Ness-Ziyona, both of Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Division of Ser. No. 858,630, Dec. 8, 1977, Pat. No. 4,139,703. This application Oct. 2, 1978, Ser. No. 947,541

Int. Cl.[2] C07D *501/36*

U.S. Cl. 544—27 **8 Claims**

1. A compound selected from the formula



wherein W is hydrogen, a $—CO_2R_4$ group wherein R_4 is hydrogen, a straight or branched 1 to 4 carbon alkyl group, or a straight or branched alkanoyloxymethyl group in which the alkanoyl group has from 2 to 5 carbon atoms; R_1 is hydrogen or methoxy; R_2 is 1,3,4-thiadiazol-2-ylthiomethyl, 5-methyl-1,3,4-thiadiazol-2-ylthiomethyl, tetrazol-5-ylthiomethyl, 1-methyltetrazol-5-ylthiomethyl, 1,3,4-oxadiazol-2-ylthiomethyl, 5-methyl-1,3,4-oxadiazol-2-ylthiomethyl, 1-methyl-1,2,3-triazol-5-ylthiomethyl, 1,2,3-triazol-5-ylthiomethyl; R_3 is hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, a straight or branched alkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 5 carbon atoms and is straight or branched, an alkanoylaminomethyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms and the amine nitrogen is substituted with a straight or branched alkyl group having 1 to 4 carbon atoms or is unsubstituted; an alkoxycarbonylaminomethyl group in which the alkoxy moiety is straight or branched and has from 1 to 4 carbon atoms and the amine nitrogen is substituted with a straight or branched alkyl group of from 1 to 4 carbon atoms or is unsubstituted, p-(alkanoyloxy)benzyl group in which the alkanoyl moiety is straight or branched and has from 2 to 5 carbon atoms; an aminoalkanoyloxymethyl group in which the alkanoyl moiety has from 2 to 15 carbon atoms and the amino nitrogen is mono- or di-substituted with a straight or branched alkyl group having from 1 to 4 carbon atoms or is unsubstituted; or pharmaceutically acceptable salts thereof.

4,200,748

PYRIDO[1',2':4,5][1,4]OXAZINO[2,3-b]QUINOXALINES AND PYRROLO[1',2':4,5][1,4]OXAZINO[2,3-b]QUINOXALINES

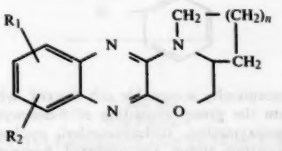
William B. Wright, Jr., Woodcliff Lake, and Andrew S. Tomcufcik, Old Tappan, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 22, 1979, Ser. No. 5,411

Int. Cl.[2] C07D *498/04*

U.S. Cl. 544—99 **12 Claims**

1. A compound selected from the group consisting of those of the formula:



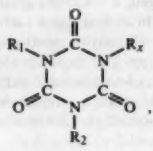
wherein n is the integer 1 or 2 and R_1 and R_2 are each individually selected from the group consisting of hydrogen, fluoro, chloro, bromo, trifluoromethyl, alkyl having up to 4 carbon atoms, alkoxy having up to 4 carbon atoms, nitro, amino, alkanoylamino having from 2 to 4 carbon atoms, benzoylamino and dimethylformamidino; and the pharmacologically acceptable acid-addition salts thereof.

4,200,749
PREPARATION OF HALOGENATED MODIFIED ISOCYANURATES

Edward E. Flagg, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Feb. 8, 1979, Ser. No. 10,297
Int. Cl.[2] C07D 251/34
U.S. Cl. 544—221 14 Claims

1. A process for the production of halogenated isocyanurate compounds of the formula:



wherein R_x is a halogenated alkyl or alkenyl radical; R_1 and R_2 are individually either halogenated alkyl radicals, halogenated alkenyl radicals or unreactive alkyl or aryl moieties, said process comprising reacting an olefin with a second reactant compound of the general formula:

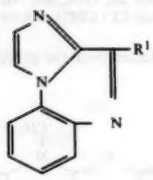
wherein X is halogen; and R_1' and R_2' are individually halogens or unreactive alkyl or aryl moieties in the presence of a halogenated aromatic solvent or an aliphatic solvent wherein the said second reactant compound is at least partially soluble.

4,200,750
4-SUBSTITUTED IMIDAZO [1,2-A]QUINOXALINES

Paul L. Warner, Jr., Clarence, and Edward J. Luber, Jr., Buffalo, both of N.Y., assignors to Westwood Pharmaceuticals Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 757,640, Jan. 7, 1977, abandoned. This application Dec. 8, 1977, Ser. No. 858,568
Int. Cl.[2] C07D 487/04; A61K 31/495; A01N 9/22
U.S. Cl. 544—346 49 Claims

1. A 4-substituted imidazo[1,2-a]quinoxaline of the formula



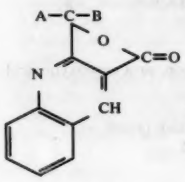
or a pharmaceutically acceptable salt thereof, wherein R^1 is selected from the group consisting of 9-decenyl, methozymethyl, phenoxymethyl, trifluoromethyl, cycloaliphatic of from 3 to 6 carbon atoms, 3-nitrophenyl, 4-nitrophenyl, 3,5-dinitrophenyl, 3-aminophenyl, 4-aminophenyl, 4-acetamidophenyl, 4-hexadecanamidophenyl, 4-chlorobenzamidophenyl, 4-acetoxyphenyl, 4-butyryloxyphenyl, 4-decanoyloxyphenyl, 4-cyanophenyl, biphenylyl, 2-carboxyphenyl, naphthyl, benxyl, styryl, phenoxyphenyl, 4-(4-methoxy)-phenoxyphenyl, 4-(4-hydroxy)-phenoxyphenyl, 3-fluorophenyl, 4-flurophenyl, 3-chlorophenyl, 3-bromophenyl, 4-bromphenyl, 4-iodophenyl, 3- methylphenyl, 4-methylphenyl, 4isobutylphenyl, 4-biphenylyl, 4- cyanophenyl, 4-amiophenyl, 4-nitrophenyl, 3-methoxyphenyl, 3, 5 dimethoxyphenyl, 4ethoxyphenyl and 2-naphthyl.

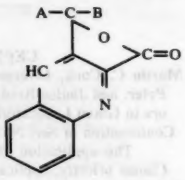
4,200,751
LACTONES OF QUINOLINE CARBOXYLIC ACIDS

Seiji Ikegami, and Yoshihiro Hatano, both of Osaka, Japan, assignors to Yamamoto Kagaku Gosei Co., Ltd., Osaka, Japan

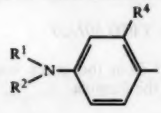
Continuation of Ser. No. 706,088, Jul. 16, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,781
Claims priority, application Japan, Aug. 6, 1975, 50-94950
Int. Cl.[2] C07D 491/14
U.S. Cl. 546—89 3 Claims

1. A compound represented by

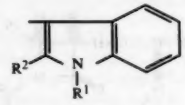




wherein A is



and B is



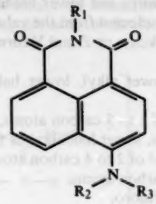
and wherein R^1 and R^2 are alkyl groups of 1 to 4 carbon atoms and R^4 is an alkoxy group of 1 to 4 carbon atoms.

4,200,752
4-DISUBSTITUTED AMINO, N-SUBSTITUTED NAPHTHALIMIDE DYESTUFFS

Robert C. Bertelson, 5312 Bliss Pl., Dayton, Ohio 45440

Filed Feb. 16, 1978, Ser. No. 878,395
Int. Cl.[2] C07D 221/14
U.S. Cl. 546—100 6 Claims

1. Quenchable fluorescent dyestuffs which are substantially soluble in low surface tension substantially non-polar oily solvents and have the formula:



wherein

R_1 is a member selected from the group consisting of:

(a) alkyl groups having from two to twelve carbon atoms,

(b) alkyl groups having from two to three carbon atoms and substituted with a methoxy or an ethoxy group,

(c) phenylalkyl groups whose alkyl moiety has from one to four carbon atoms and

(d) monocyclic alicyclic rings having from five to six carbon atoms in the alicyclic ring;

R_2 and R_3 are members selected from the group consisting of:

(a) alkyl groups having from one to twenty-two carbon atoms,

(b) phenylalkyl groups whose alkyl moiety has from one to four carbon atoms,

(c) monocyclic alicyclic groups having up to twelve carbon atoms,

(d) tetrahydrofuranylmethyl and

(e) a single alkylene chain forming a single heterocyclic ring with the amino nitrogen, said ring containing five or six members;

with the provisos that the total number of carbon atoms in R_1, R_2 and R_3 is at least nine, and the total number of carbon atoms in R_2 and R_3 is at least four.

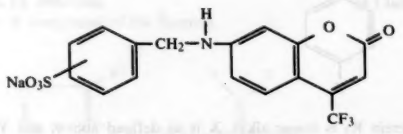
4,200,753

WATER-SOLUBLE FLUORESCING AND LASING DYES

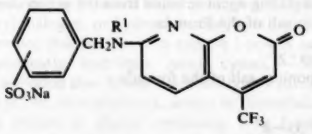
Ronald A. Henry, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 17, 1978, Ser. No. 961,578
Int. Cl.² C07D *491/04, 311/16*
U.S. Cl. 546—116 **2 Claims**

1. A compound having the structure:



2. A compound having the structure:



wherein R^1 is selected from the group consisting of H and CH_3.

4,200,754

METHOD FOR PREPARING 7,8-DICHLORO-1,2,3,4-TETRAHYDROISOQUINOLINE

Kenneth G. Holden, Haddonfield, N.J., and Carl D. Perchonock, Philadelphia, Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Filed Feb. 2, 1979, Ser. No. 9,551
Int. Cl.² C07D *217/06*
U.S. Cl. 546—150 **4 Claims**

1. The method of preparing 7,8-dichloro-1,2,3,4-tetrahydroisoquinoline, which comprises the steps of reacting N-acetyl-2,3-dichlorobenzylaminoacetaldehyde dimethyl acetal with a Lewis acid to form N-acetyl 7,8-dichloro-1,2-dihydroisoquinoline, catalytically hydrogenating said dihydroisoquinoline to N-acetyl-7,8-dichloro-1,2,3,4-tetrahydroisoquinoline, and hydrolyzing said tetrahydroisoquinoline to 7,8-dichloro-1,2,3,4-tetrahydroisoquinoline.

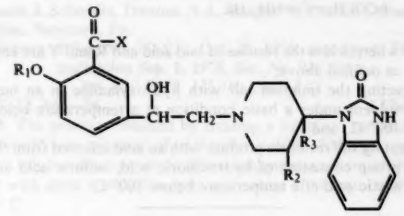
4,200,755

2-HYDROXY-5-[1-HYDROXY-2-[4-(2-OXO-1-BENZIMIDAZOLINYL)PIPERIDINO]ETHYL]BENZOIC ACID DERIVATIVES

J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed May 4, 1979, Ser. No. 36,245
Int. Cl.² C07D *401/04*
U.S. Cl. 546—199 **6 Claims**

1. A derivative of 2-hydroxy-5-[1-hydroxy-2-[4-(2-oxo-1-benzimidazolinyl)piperidino]ethyl]benzoic acid having the formula



wherein

X is selected from the group consisting of hydroxy, methoxy, ethoxy, amino, dimethylamino and alkylamino in which the alkyl group has from 1 to 12 carbon atoms;

R_1 is hydrogen, methyl or ethyl;

R_2 and R_3 are hydrogen or when taken together form a double bond;

and the pharmaceutically acceptable acid addition salts thereof.

4,200,756

METHYL 3-(3-ETHYLUREIDO)-1,2,5,6-TETRAHYDRO-2-OXOPYRIDINE-4-CARBOXYLATE

George C. Wright, and Ronald E. White, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Dec. 7, 1978, Ser. No. 967,366
Int. Cl.² C07D *211/90*
U.S. Cl. 546—297 **1 Claim**

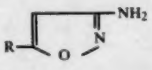
1. The compound methyl 3-(3-ethylureido)-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate.

4,200,757
PROCESS FOR THE PRODUCTION OF 3-AMINOISOXAZOLES

Yasuo Makisumi, Kawanishi; Akira Murabayashi, Ibaraki, and Takashi Sasatani, Sakai, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

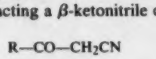
Filed Jun. 5, 1978, Ser. No. 912,252
Claims priority, application Japan, Jun. 8, 1977, 52-68173
Int. Cl.[2] C07D *251/08*
U.S. Cl. 548—246 **4 Claims**

1. A process for the production of a 3-aminoisoxazole of the formula:



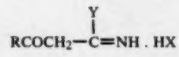
wherein R is C_1–C_6 alkyl, phenyl or halophenyl, which process comprises

reacting a β-ketonitrile of the formula:



wherein R is as defined above, with a compound of the formula:

wherein Y is C_1–C_6 alkoxy or C_1–C_6 alkylthio, in the presence of an acid selected from the group consisting of hydrogen chloride, hydrogen bromide and sulfuric acid in a solvent, with cooling below room temperature, to give an iminium salt of the formula:



wherein X is the residue of said acid and R and Y are each as defined above,

reacting the iminium salt with hydroxylamine in an inert solvent under a basic condition at a temperature below 100° C., and

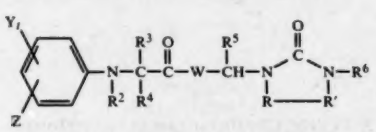
treating the resultant product with an acid selected from the group consisting of hydrochloric acid, sulfuric acid and acetic acid at a temperature below 100° C.

4,200,758
2,4-IMIDAZOLIDINEDIONYLMETHYL ESTERS AND THIOLESTERS OF ANILINO ACIDS

Clive A. Henrick, Palo Alto, and Gustave K. Kohn, Berkeley, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Filed Mar. 19, 1979, Ser. No. 21,666
Int. Cl.[2] C07D *233/72*
U.S. Cl. 548—312 **38 Claims**

1. A compound of the following formula:



wherein,

one of R and R' is carbonyl and the other is methylene or lower alkylmethylene;

W is oxygen or sulfur;

t is zero, one, two, three or four;

Y is independently selected from hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylcarbonyl, lower alkoxycarbonyl, lower acyloxy, halogen, cyano, nitro and lower haloalkylthio;

Z is independently selected from the values of Y, cycloalkyl, and lower haloalkoxy; or Z and Y form a methylenedioxy group;

R^2 is hydrogen, lower alkyl, lower haloalkylcarbonyl, or formyl;

R^3 is lower alkyl of 2 to 5 carbon atoms, lower alkenyl of 2 to 5 carbon atoms, lower haloalkyl of 1 to 4 carbon atoms, lower haloalkenyl of 2 to 4 carbon atoms, or lower cycloalkyl of 3 or 4 carbon atoms;

R^4 is hydrogen or fluoro;

R^5 is hydrogen, methyl, ethyl, cyano, or ethynyl; and

R^6 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl.

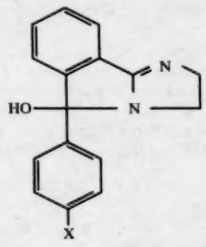
4,200,759
PREPARATION OF IMIDAZO[2,1-a]ISOINDOLE COMPOUNDS

Robert A. Dickinson, Chateauguay, Canada, assignor to Delmar Chemicals, Limited, LaSalle, Canada

Filed Jul. 20, 1978, Ser. No. 926,407
Int. Cl.[2] C07D *487/04*
U.S. Cl. 548—324 **34 Claims**

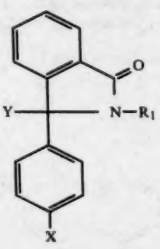
1. Process for the preparation of an imidazo [2,1-a] insoindole of formula I:

I



wherein X is hydrogen, halogen or lower alkoxy, comprising (a) reacting a compound of formula II:

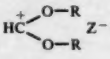
II



wherein R_1 is lower alkyl, X is as defined above, and Y is NR_2R_3 or —O—R_4, wherein R_2, R_3 and R_4 are individually lower alkyl or R_2 and R_3 together are an alkylene chain of formula—$(CH_2)_n$—wherein n is 4, 5 or 6;

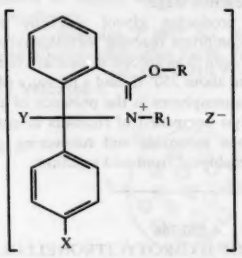
with an alkylating agent selected from the group consisting of an oxonium salt of the formula:

and a carbonium salt of the formula:



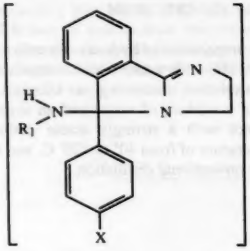
in which formulae R is methyl or ethyl, and Z^- is the fluoroborate, hexachloroantimonate or hexafluorophosphate ion, to form a corresponding salt of formula III:

III



(b) reacting said salt with ethylene diamine to form an intermediate of formula IV:

IV



and (c) hydrolyzing said compound of formula IV to form the compound of formula I.

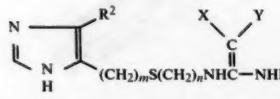
4,200,760

IMIDAZOLYLALKYLTHIOALKYLAMINO-ETHYLENE DERIVATIVES

Aldo A. Algieri, Fayetteville, and Ronnie R. Crenshaw, Dewitt, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Sep. 26, 1978, Ser. No. 945,966
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—342 **14 Claims**

1. A compound of the formula



wherein R^1 is a straight or branched chain alkynyl group containing from 3 to 9 carbon atoms, inclusive; R^2 is hydrogen, (lower)alkyl, halogen, or hydroxymethyl; m is 1 or 2, and n is 2 or 3, provided that the sum of m and n is 3 or 4; X and Y each are independently hydrogen, nitro, cyano, $—SO_2Ar$ or $—COR^3$, provided that X and Y are not both hydrogen; R^3 is (lower)alkyl, Ar, (lower)alkoxy, amino or (lower)alkylamino; and Ar is phenyl or phenyl containing 1 or 2 substituents independently selected from halogen and (lower)alkyl; or a nontoxic pharmaceutically acceptable acid addition salt thereof.

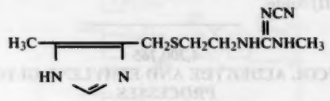
4,200,761

PROCESS FOR PREPARING N-CYANO-N'METHYL-N''-{2-[(4-METHYL-5-IMIDAZOLYL)-METHYLTHIO]-ETHYL} GUANIDINE

Branko Jenko, Ljubljana-Polje; Igor Langof, and Jŏza Habjan, both of Ljubljana, all of Yugoslavia, assignors to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o., Ljubljana, Yugoslavia

Filed Apr. 18, 1979, Ser. No. 31,239
Claims priority, application Yugoslavia, Apr. 26, 1978, 998/78
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—342 **10 Claims**

1. A process for preparing N-cyano-N'-methyl-N''-{2-[(4-methyl-5-imidazolyl)-methylthio]-ethyl}guanidine of the formula



characterized in that 4-thiomethyl-5-methyl imidazole is reacted with N-cyano-N'-methyl-N''-(2-chloroethyl)guanidine in a two-phase system under the conditions of phase transfer catalysis.

4,200,762

ACTINIC RADIATION CURABLE POLYMERS

Claude J. Schmidle, Trenton, N.J., assignor to Thiokol Corporation, Newtown, Pa.

Division of Ser. No. 736,922, Oct. 29, 1976, abandoned. This application Sep. 1, 1978, Ser. No. 939,034
Int. Cl.[2] C07C *125/04*; C08F *8/00*
U.S. Cl. 560—26 **4 Claims**

1. The product obtained by treating a hydroxyl terminated poly(ethylene adipate) of molecular weight 800 endcapped with toluene diisocyanate to a final isocyanate content of about 3.0 with about a stoichiometric equivalent of benzoin at about 60° C.

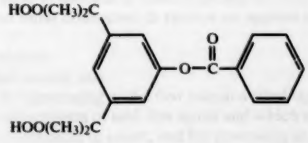
4,200,763

BENZOIC ACID ESTER DERIVATIVE

Sheng-Hong A. Dai, Wallingford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 879,788, Feb. 21, 1978, Pat. No. 4,164,510, which is a continuation-in-part of Ser. No. 818,233, Jul. 22, 1977, abandoned. This application May 11, 1979, Ser. No. 38,257
Int. Cl.[2] C07C *69/78*
U.S. Cl. 560—109 **1 Claim**

1. A dihydroperoxide having the formula



4,200,764

OXIDATION OF ALIPHATIC HYDROCARBONS WITH HIGH STRENGTH HYDROCARBON OXIDATION CATALYST

William E. Slinkard, Corpus Christi, Tex.; Anthony B. Baylis, Berkeley Heights, N.J., and Michael P. Hughes, Odessa, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,896
Int. Cl.[2] C07C *51/20, 53/08*
U.S. Cl. 562—549 10 Claims

1. A process for preparing acetic acid by the vapor phase oxidation of alkanes containing from 2 to 10 carbon atoms with an oxygen containing gas in the vapor phase in the presence of steam and a catalytic amount of a catalyst consisting essentially of a reduced vanadium oxide catalyst containing from about 1 to about 50 mols percent chromium oxide calculated as chromium (III) oxide.

4,200,765

GLYCOL ALDEHYDE AND ETHYLENE GLYCOL PROCESSES

Richard W. Goetz, Cincinnati, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 724,126, Sep. 17, 1976, abandoned. This application Mar. 9, 1978, Ser. No. 884,877
Claims priority, application Ireland, Sep. 12, 1977, 1874/77
Int. Cl.[2] C07C *29/14, 31/20, 47/19*
U.S. Cl. 568—862 24 Claims

1. A process which comprises reacting formaldehyde, carbon monoxide and hydrogen in an aprotic solvent at a temperature of from about 75° C. to about 250° C. and superatmospheric pressure up to about 700 atmospheres to form glycol aldehyde in a first reaction stage and subsequently catalytically reducing the glycol aldehyde to form ethylene glycol in a second reaction stage, wherein a catalytic amount of rhodium in complex combination with carbon monoxide is present at least during said first reaction stage.

7. A process for producing glycol aldehyde and/or ethyleneblycol which comprises reacting formaldehyde, carbon monoxide and hydrogen in an aprotic solvent at a temperature of from about 75° to about 250° C. and a pressure of from about 10 to about 700 atmospheres in the presence of a catalytic amount of a catalyst comprised of rhodium in complex combination with carbon monoxide and recovering glycol aldehyde and/or ethyleneblycol from said reaction.

4,200,766

PREPARATION OF HYDROXYCITRONELLOL

Werner Hoffmann, Neuhofen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,705
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1977, 2755945
Int. Cl.[2] C07C *29/04*
U.S. Cl. 568—875 2 Claims

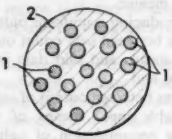
1. A process for the preparation of hydroxycitronellol (I) by hydration of citronellol (II) with water which comprises contacting a homogeneous solution, containing, per kilogram of II, from 0.1 to 10 liters of a mixture of water and an α-methyl-branched C_3–C_5-alkanol with a strongly acidic cation exchange resin at a temperature of from 40° to 120° C. and thereafter recovering I by conventional distillation.

4,200,767

SUPERCONDUCTOR COVERED WITH REINFORCED ALUMINUM MATRIX

Harehiko Nomura, Musashi-Murayama; Kenichi Koyama, Tokorozawa, and Kazuhiko Terao, Komoro, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 7, 1977, Ser. No. 757,651
Claims priority, application Japan, Jan. 13, 1976, 51-2419
Int. Cl.² H01B *12/00*
U.S. Cl. 174—126 S 3 Claims



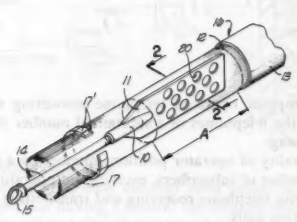
1. A superconductor covered with an aluminum matrix of augmented tensile strength, which comprises at least one superconductive wire and an aluminum matrix laid to cover the outer surface of said at least one superconductive wire and having alumina dispersed therein, said at least one superconductive wire and said aluminum matrix having been co-drawn.

4,200,768

CABLE ASSEMBLY AND METHOD OF MAKING THE SAME

John W. Anhalt, Orange; David S. Goodman, Mission Viejo, and Gerald J. Selvin, Huntington Beach, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,563
Int. Cl.² H02G *15/22*
U.S. Cl. 174—79 7 Claims



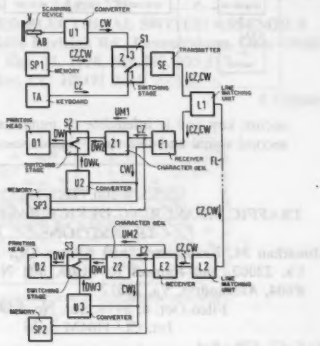
1. A cable assembly comprising: a cable having a jacket including an open end, said cable having a plurality of filaments arranged lengthwise in said jacket, said filaments having coextensive lengthwise portions projecting beyond the said open end of said jacket; a body positioned in the midst of said filaments; and a hardened resin-like material located in the spaces between said filament portions and said body, and bonded to said filament portions and bonded to said body to hold said body and said filament portions in fixed positions relative to each other.

4,200,769

PROCESS AND ARRANGEMENT FOR SELECTIVELY TRANSMITTING PREDETERMINED CHARACTERS OR GRAPHIC PATTERNS

Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1978, Ser. No. 942,928
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1977, 2748253
Int. Cl.² B41J *5/00;* G06K *15/02;* H04L *15/24*
U.S. Cl. 178—30 13 Claims



1. In a process for transmitting predetermined characters or graphic patterns from a transmitting station to a receiving station, wherein the receiving station includes a printing head having at least one printing component and is supplied with binary character sequences of data words which trigger printing commands, a character generator is provided in the receiving station to store binary character sequences which represent the predetermined characters and emit the sequences to the printing head upon receipt of data words assigned to the predetermined characters, the improvement for graphic pattern transmission comprising the steps of:

producing code words representing graphic patterns and having the same format as the data words; transmitting the code words in place of the data words from the transmitting station to the receiving station; receiving the code words at the receiving station; converting the received code words into binary character sequences; and

feeding the last-mentioned binary character sequences to the printing head in place of the first-mentioned binary character sequences.

4,200,770

CRYPTOGRAPHIC APPARATUS AND METHOD

Martin E. Hellman, Stanford; Bailey W. Diffie, Berkeley, and Ralph C. Merkle, Palo Alto, all of Calif., assignors to Stanford University, Palo Alto, Calif.

Filed Sep. 6, 1977, Ser. No. 830,754
Int. Cl.² H04L *9/04*
U.S. Cl. 178—22 8 Claims

1. A secure key generator comprising:

a first input connected to receive an applied first signal;

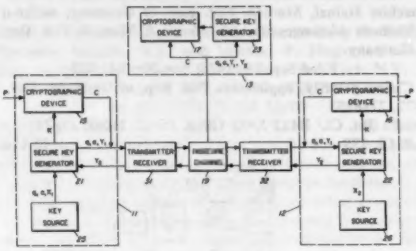
a second input connected to receive an applied second signal;

a first output;

a second output; and

means for generating at the first output a third signal, that is a transformation of said first signal and which transformation is infeasible to invert, and for generating at the second

output a fourth signal, that is a transformation of said second signal with said first signal, which represents a



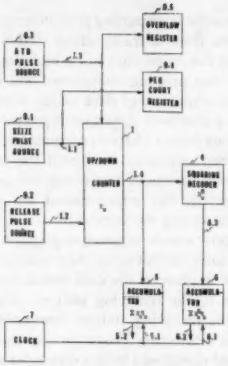
secure key and is infeasible to generate solely with said second signal and said third signal.

4,200,771

TRAFFIC MEASURING DEVICE BASED ON STATE TRANSITIONS

Jonathan M. Kraushaar, 7610 Allman Dr., #302, Annandale, Va. 22003, and Ramses R. Mina, 301 N. Beauregard St., #604, Alexandria, Va. 22312

Filed Oct. 6, 1978, Ser. No. 949,135
Int. Cl.[2] H04M *3/36*
U.S. Cl. 179—8 A **18 Claims**



1. In a traffic measuring system a device enabling the continuous measurement of average server occupancy, often referred to as the traffic, over a measurement interval which may also be referred to as a measurement period, defined as beginning when all monitored servers have simultaneously become occupied, said condition also termed a server congestion state, and ending at any desired time when traffic observations are made, utilizing seize pulses, each of which indicates that a server has become occupied, all servers busy pulses also referred to herein as congestion pulses, each of which indicates that a congestion state has been reached, and release pulses, each of which indicates that a server has been released from use to measure traffic on a group of servers without requiring the scanning of individual servers, and thereby reducing the required number of measuring leads to measure traffic usage, comprising:

an up/down counting means including a first input means driven by said server seize pulses for incrementing count of said up/down counting means, a second input means driven by said server release pulses for decrementing count of said up/down counting means, and a third input means driven by said all servers occupied pulses for enabling count of said up/down counting means to be preset to a predetermined value, and count output means for indicating counting state of said up/down counting means;

an accumulating means, which continuously records and updates a non-normalized value of average server occupancy expressed mathematically as $\Sigma X_k d_k$, where X_k is the server occupancy state at the kth instant of time and d_k is a measure of the duration of said occupancy state during said measurement interval, including a data input means, a data output means, and an accumulate enable input means for triggering accumulation of data present at said data input means;

a clock means, producing a uniform pulse train;

connecting means between said count output means of said up/down counting means and said data input means of said accumulating means; and

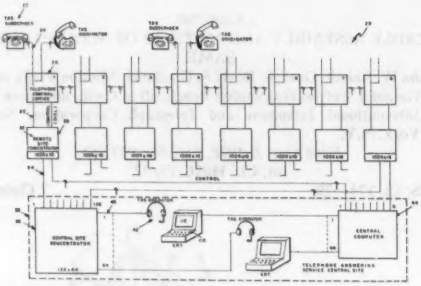
a connecting means between output of said clock means and accumulate enable input means of said accumulating means allowing accumulation of values scored in said up/down counting means at every clock pulse during said measurement interval, so that each state scored in said up/down counting means is added in said accumulating means a number of times proportional to duration of said state.

4,200,772

COMPUTER CONTROLLED TELEPHONE ANSWERING SYSTEM

Ronald P. Vicari, Elmwood Park, N.J., and Barry Yampol, Oyster Bay, N.Y., assignors to Graphic Scanning Corp., Englewood, N.J.

Division of Ser. No. 591,233, Jun. 27, 1975, Pat. No. 3,987,252, which is a continuation-in-part of Ser. No. 392,634, Aug. 29, 1973, abandoned. This application Oct. 18, 1976, Ser. No. 733,358
Int. Cl.[2] H04M *3/50*
U.S. Cl. 179—27 FH **15 Claims**



1. A computer operated telephone answering system for answering the telephones of a substantial number of subscribers comprising:

(a) a plurality of operator positions numbering a fraction of the number of subscribers, each of said operator positions including telephone receiving and transmitting means for answering calls;

(b) visual data display means at each of said operator positions for displaying alphanumeric data pertaining to an individual subscriber;

(c) data entry keyboard means also at each of said operator positions for recording for later display alphanumeric messages for transmittal to a subscriber;

(d) a plurality of incoming telephone lines;

(e) coupling means for coupling the signal from a selected telephone line to a selected operator position;

(f) computer control means coupled to the visual display means and data entry keyboard means of each of said operator positions;

(g) line scanning means for scanning each of said incoming

telephone lines for a predetermined number of rings to determine whether the line should be answered;

(h) subscriber recognizing means for recognizing the subscriber related to an incoming call reaching said predetermined number of rings for answering the line;

(i) operator selecting means included in said computer control means for selecting one of said operator positions available for use;

(j) coupling control means included in said computer control means for controlling coupling of the signal of said line to be answered to a selected operator position; and

(k) data storage means included in said computer control means for storing and recalling data relative to said call to be answered;

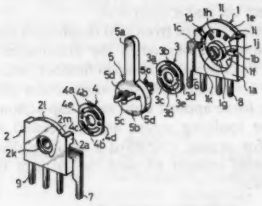
(l) whereby said computer control means selects and transmits to the visual display means of said selected operator position data from said storage means which is relative to the subscriber associated with said call to permit the selected operator to answer the call.

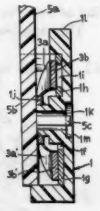
4,200,773

SWITCH

Hiroaki Komatsu, and Tsumoru Oka, both of Tohda, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jul. 17, 1978, Ser. No. 924,961
Claims priority, application Japan, Jul. 19, 1977, 52-96320[U]
Int. Cl.[2] H01H *19/48, 21/68*
U.S. Cl. 200—11 R **13 Claims**





1. A switch comprising

a first and second case member each including a recessed base portion having a central opening therethrough, said case members being joined together with the recesses of said base portions facing one another to form a central space;

each of said case members having a respective plurality of fixed contacts and a single common contact fixed within the recess of its base portion so as to lie around said opening therein, each of said contacts having a terminal portion extending outwardly from the respective case member;

an operation member having a disc member disposed rotatably within said space and a lever portion extending outwardly from said joined case members for rotating said disc portion about the axis of said openings;

fastener members extending axially outward from respective faces of said disc portion, said fastener members each having end portions adapted to extend through a respective opening of a case member to engage the outer surface thereof for holding said case members together; and

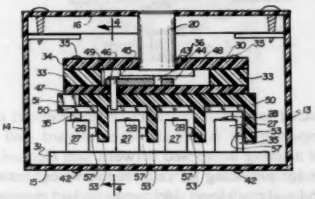
a first and second contact member each secured to respective faces of said disc portion and slidable along the contacts within a recess of a respective base portion to enable selective switching between the contacts by actuation of said lever portion.

4,200,774

KEY-OPERATED ELECTRICAL SWITCH ASSEMBLY

David E. Nelms, 6454 Lexleigh Rd., Reynoldsburg, Ohio 43068

Filed Aug. 21, 1978, Ser. No. 935,517
Int. Cl.[2] H01H *9/28, 27/06*
U.S. Cl. 200—44 **9 Claims**



1. A key-operated electrical switch assembly comprising

a structural support frame including an elongated planar top plate having a longitudinal axis in the plane of said plate,

an electrical switch mounted in fixed relationship on said structural frame and having an actuating element selectively displaceable between first and second positions,

a key-operated lock device having a mounting barrel, a lock cylinder selectively rotatable in said barrel about a cylinder axis by means of a key selectively insertable in said lock cylinder and a lock bolt, said barrel fixedly mounted on said planar top plate with the lock cylinder axis perpendicular thereto, said lock cylinder and lock bolt having a mechanical coupling means for directly effecting a translation of horizontal rotary movement of the vertical lock cylinder to rectilinear displacement of said lock bolt along the longitudinal axis of said planar top plate, said rectilinear displacement occuring in a horizontal plane perpendicular to the vertical plane associated with the lock cylinder, and

coupling means interposed between said lock bolt and the actuating elements of said electrical switch to affect operation of said switch.

4,200,775

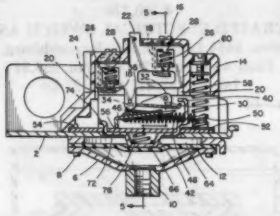
PRESSURE RESPONSIVE SWITCH WITH LOW PRESSURE CUTOFF

Michael Bodnar, West Chicago, Ill., assignor to Furnas Electric Company, Batavia, Ill.

Filed Jun. 19, 1978, Ser. No. 916,759
Int. Cl.[2] H01H *35/34*
U.S. Cl. 200—83 S **5 Claims**

1. In a pressure responsive switch having a supporting structure, fixed contacts, a movable contact carrier thereon carrying movable contacts for engagement and disengagement with the fixed contacts, a diaphragm housing and a diaphragm therein, means for connecting the diaphragm housing to pressure source, and means responsive to movement of the diaphragm as the pressure changes in the source to cause the contacts to open and close to maintain the pressure between a predetermined high value and first predetermined low value, the improvement comprising: a main lever pivotable in said supporting structure, adjustable main spring means urging said lever in one direction, a dome-like element having a portion engaging said diaphragm and engageable with the underside of

said main lever to cause said main lever to rotate against the force of said main spring means as the diaphragm moves in response to increasing fluid pressure, pivoting means mounted between said main lever and the contact carrier to cause said contact carrier to move the movable contacts away from the fixed contacts when the pressure in the source exceeds the predetermined high value, and to permit movement of said contact carrier to move the movable contacts toward the fixed contacts when the pressure in the source is less than a first



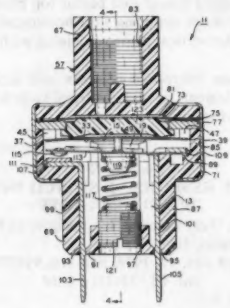
predetermined low value, portions of said element extending through openings in said main lever toward said pivoting means and a spring interposed between said element and said main lever for providing for relative movement between said element and said main lever, and means on said element operating said pivoting means upon relative movement of said element and said main lever to cause the contact carrier to move away from the fixed contacts when the pressure in the source is less than a second predetermined low value which in turn is less than the first predetermined low value.

4,200,776

CONTROL DEVICE WITH GRAIN ORIENTED SNAP DISK

Ronald W. Poling, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Nov. 13, 1978, Ser. No. 960,172
Int. Cl.[2] H01H 35/34
U.S. Cl. 200—83 P **21 Claims**



1. A control device comprising:

a pair of housing members secured together against displacement;

an opening through one of said housing members and having a pair of opposite end portions;

diaphragm means interposed between said housing members for closing one of said end portions of said opening and for defining with the other of said housing members an expansible chamber therein adapted to be subjected to fluid pressure;

a pair of opposite generally arcuate seating surfaces extending generally about said opening adjacent said one end portion thereof and each having a pair of opposite ends;

a pair of opposed notches in said one housing member and each one disposed between adjacent opposite ends of said seating surface pair, respectively;

at least a pair of oppositely spaced apart abutments in said one housing member and arranged within said opening generally adjacent said seating surface pair between said opposite ends thereof, respectively;

a snap-action member having a body of grain oriented metallic material with the grain orientation extending in a predetermined direction across said body, said body including a peripheral edge defining a generally constant diameter about at least a major part of said body and disposed in seating engagement on said seating surface pair, a pair of opposite projections integral with said body and extending therefrom generally in the predetermined direction of the grain orientation in the metallic material of said body, said projection pair being disposed in said notch pair so as to at least limit rotational displacement movement of said peripheral edge on said seating surface pair generally about said opening;

a pair of terminal means mounted in said one housing member and extending through the other of said end portions of said opening exteriorly of said one housing member;

a resilient current carrying switch arm connected with one of said terminal means within said opening;

a contact on said switch arm;

another contact on the other of said terminal means within said opening and arranged for engagement with said first named contact on said switch arm;

means for applying a force from said diaphragm means onto said snap-acting member when the diaphragm means is subjected to fluid pressure in said chamber; and

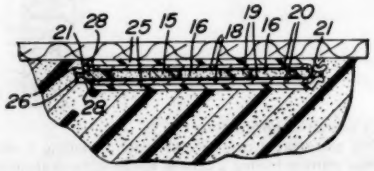
resilient means associated with said snap-action member for opposing the force applied onto said snap-action member by said force applying means and associated with said switch arm for urging it toward a position disengaging said first named contact on said switch arm from said another contact.

4,200,777

PRESSURE SWITCH

Norman K. Miller, Concord Industrial Park, Concordville, Pa. 19331

Division of Ser. No. 789,807, Apr. 22, 1977, Pat. No. 4,137,116. This application Jun. 12, 1978, Ser. No. 914,677
Int. Cl.[2] H01H 21/26
U.S. Cl. 200—85 A **6 Claims**



1. Pressure switch means comprising an intermediate layer of non-conductive resiliently yieldable sheet material with openings, a pair of contact layers of conductive flexible sheet material in unsecured facing engagement with opposite sides of and defining a sandwich with said intermediate layer, said sandwich being flexible for electrical contact of said contact layers through one of said openings of said intermediate layer, and a pair of enclosure layers of non-conductive flexible sheet material in unsecured facing engagement with opposite sides of said sandwich, one pair of opposite edge margins of said intermediate layer extending beyond said contact layers and being secured to and between said enclosure layers without securement to said contact layers, said enclosure and intermediate

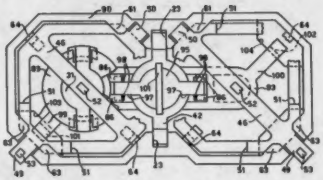
layers combining to define flat pockets on opposite sides of said intermediate layer conformably receiving said contact layers without positive securement to the latter.

4,200,778

ELECTRIC KEYBOARD OF SNAP-CONTACT TYPE

Michele Bovio, Banchette, and Pietro Castellano, Castellamonte, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed May 19, 1978, Ser. No. 907,491
Claims priority, application Italy, May 23, 1977, 68166 A/77
Int. Cl.[2] B41B 9/02; H01H 1/06
U.S. Cl. 200—159 B 21 Claims



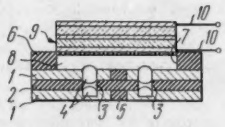
1. A keyboard comprising an electrical circuit and an elastically deformable lamina for going with a snap action from a stable configuration to an unstable configuration to complete said electrical circuit in only one of said configurations, wherein said lamina has the form of two mutually transverse pairs of parallel edge strips said strips converge to two corners integral with opposite ends of a diagonal strip and the edge strips have permanent bends set into them to bow the diagonal strip in the stable configuration of the lamina.

4,200,779

DEVICE FOR SWITCHING ELECTRICAL CIRCUITS

Anatoly V. Zakurdaev, and Andrei B. Luzhensky, both of Moscow, U.S.S.R., assignors to Moscovsky Inzhenerno-Fizichesky Institut, U.S.S.R.

Filed Aug. 28, 1978, Ser. No. 937,097
Claims priority, application U.S.S.R., Sep. 6, 1977, 2520712[I]
Int. Cl.[2] H01H 29/28
U.S. Cl. 200—187 1 Claim



1. A device for switching electrical circuits, comprising

a plurality of electrical circuits, each including a group of electrodes separated by insulators;

a duct in each said group formed by coaxial holes in said electrodes and insulators and filled partially with a conducting liquid wetting the surface of said electrodes within said duct;

a duct sealing element in common with all said ducts;

a cavity in said duct sealing element filled with a dielectric liquid communicating with said ducts of all said groups; and

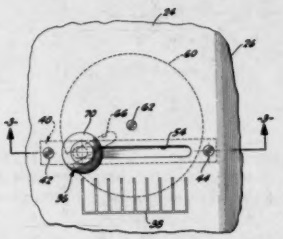
an element mechanically linked to said duct sealing element for controlling the flow of said conducting liquid within said ducts by acting on said duct sealing element and producing a compressive wave which is passed simultaneously through the dielectric liquid to all said ducts and synchronously alters the position of the conductive liquid in all said ducts simultaneously thereby selectively placing said electrodes in electrical contact or electrically separating said electrodes.

4,200,780

CONTROL ASSEMBLY WITH ROTATING DISC COVER FOR SLIDING CONTROL

John V. Romano, San Jose, Calif., assignor to Atari, Inc., Synnyvale, Calif.

Filed Jan. 18, 1978, Ser. No. 870,276
Int. Cl.[2] H01C 10/44, 9/04
U.S. Cl. 200—302 7 Claims



1. A control panel assembly for an amusement game having a control element which is movable linearly by a user's providing linear motion to operate an electrical circuit, the assembly comprising the combination of a panel having an elongate slot through which the control element projects and along which the control element is movable linearly, said control element being part of an electrical device mounted on the inside of said panel, a disc positioned in close-spaced parallel relationship with a side of the panel at a location where the disc substantially covers the panel slot, means for mounting the disc for rotation about an axis perpendicular to the panel, and means for coupling the disc with the control element while leaving the control element extending beyond the panel and the disc to permit the control element to move along the slot while the disc rotates and continues to substantially cover the portion of the slot not occupied by the control element, said coupling means including means forming a radially extending slot in said disc, said control element projecting through the disc slot for relative sliding movement therealong as the element undergoes linear movement along the panel slot for operating the electrical circuit, said disc being positioned between the electrical device and the panel whereby the disc covers the panel slot on the inside of the panel.

4,200,781

MANUAL SWITCH FOR PORTABLE TOOLS

Merlin R. Dummer, Arab, Ala., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 15, 1978, Ser. No. 933,833
Int. Cl.[2] H01H 3/12, 13/00
U.S. Cl. 200—340 15 Claims

1. An electric switch comprising:

stationary and movable contact-terminal means having contact portions and terminal portions for connecting the same to an electric circuit;

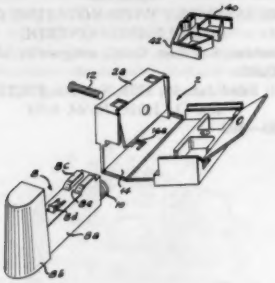
switch operator means for closing and reopening said contact portions;

a housing comprising a single-piece molding having contact-terminal retaining structure thereon and at least two thin hinge portions whereby after said contact-terminal means have been placed on said retaining structure said single-piece molding is folded at right angles at said two thin hinge portions into a generally U-shaped folded state to enclose said contact-terminal means;

said housing also having an opening for said switch operator

means defined by said two right angle folds and said contact-terminal retaining structure;

means mounting said switch operator means in said housing



so as to extend out through said opening and to be operable to actuate said movable contact-terminal means;

and means for securing said housing together in said folded state.

4,200,782

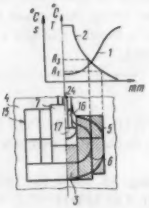
METHOD AND DEVICE FOR REGULATING PARAMETERS OF THERMAL CYCLES IN ELECTROSLAG WELDING

Evsei M. Kuzmak; Nikolai N. Koshelev, both of Moscow; Anas N. Khakimov, Zhukovsky; Tamara V. Yashunskaya, Moscow; Ljubov A. Efimenko, poselok Gazoprovod; Mark S. Skuditsky, Moscow; Semen A. Zandberg-Berger, Volograd; Grigory I. Bublki, Volograd, and Lev M. Bronshtein, Volograd, all of U.S.S.R., assignors to Moskovsky Institut Neftekhimicheskoi I Gazovoi Promyshlennosti Imeni I.M. Gubkina, Moscow, U.S.S.R.

Continuation of Ser. No. 634,323, Nov. 21, 1975, abandoned. This application Sep. 30, 1977, Ser. No. 838,234

Int. Cl.² B23K *9/18*

U.S. Cl. 219—73.1 **5 Claims**



1. A device for controlling thermal cycle parameters in electroslag welding, comprising a slide block with passages for delivery of the cooling liquid thereinto, a plurality of jets with passages for delivery of the cooling liquid, said jets being secured to the side and bottom faces of said slide block; jet passages for delivering cooling liquid communicating with slits for spraying cooling medium and each slit at a side facing the surface of a base metal being cooled being fitted with a nozzle for distributing cooling medium over the surface of the welded joint being cooled, said side and bottom faces of said block having bosses with passages for connecting passages of said slide block with said jet passages, said bosses securing said jets in place.

4,200,783

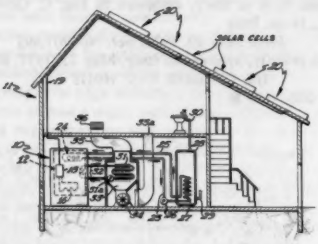
APPARATUS FOR COLLECTING AND THERMALLY STORING ENERGY

Boyd P. Ehret, 4059 Douglas Dr., Crystal, Minn. 55422

Filed Jul. 18, 1977, Ser. No. 816,475

Int. Cl.² F24H *7/02*; H05B *1/00*; F24D *11/00*

U.S. Cl. 219—365 **6 Claims**



1. Apparatus for collecting and storing energy comprising:

a unit for collecting and converting non-electrical energy into electrical energy,

a thermal energy storage cell for storing thermal energy comprising an inner, metallic core formed of a solid piece of ferrous material,

external thermal insulation engaging and enclosing the metallic core,

electric heating means within said core capable of heating said core to a temperature of at least 1,000° F.

conductor means electically connecting said heating means and said energy collecting unit for supplying electrical energy produced by said unit to said heating means, said conductor means including temperature control means for controlling the supply of current to said heating means, said control means permitting said heating means to heat said metallic core to a temperature of approximately 1,000° F., said core remaining in a solid, dimensionally stable condition during heating thereof, to said temperature,

conduit means extending between and interconnected with said inner metallic core and heat utilizing system, for circulating a heat transfer liquid therebetween, said conduit means including a heat input coil portion thereof disposed within said inner metallic core, and a heat output portion associatd with said heat utilizing means,

a heat transfer liquid within said conduit means, said heat transfer liquid having a boiling point above 1,000° F.,

means connected with said conduit means for circulating said transfer liquid through said conduit means between said metallic core and the heat utilizing system whereby said transfer liquid will be heated by said metallic core, said heat transfer fluid remaining in a liquid condition when heated by the metallic core to a temperature of approximately 1,000° F.

4,200,784

HOLLOW SHAFT BORE HEATER ASSEMBLY

Jacques E. Albaric, Nimes, France; Forrest E. Coyle, Pittsburgh, and Thomas P. Sherlock, Lansdowne, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 5, 1977, Ser. No. 857,481

Int. Cl.² H05B *11/02*

U.S. Cl. 219—470 **9 Claims**

1. A shaft bore heater assembly comprising:

a hollow, heat conductive rotatable shaft having an inside and an outside surface;

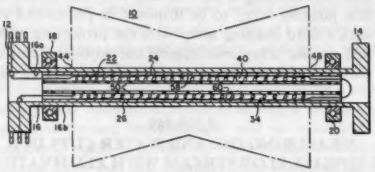
a plurality of heater foundation members having inner and outer surfaces, at least a portion of said outer surfaces being engageable with said shaft's inside surface, said

members having open-mount slots in one of said surfaces, said slots having bottoms;

a plurality of electrical heaters insertable in said slots, said electrical heaters being electrically interconnected and having electrical leads at least at one axial end, said heaters being electrically insulated from said foundation members;

means for restraining said heaters in said slots; and

means for biasing said foundation members' outer surfaces into engagement with said shaft's inside surface.

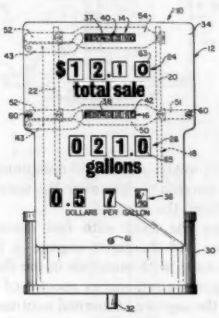


4,200,785

PULSE GENERATOR UNIT FOR FUEL PUMP REGISTER

Alfred C. Evans, Simsbury, and Bruno S. Smilgys, Hartford, both of Conn., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Jun. 5, 1978, Ser. No. 912,308
Int. Cl.[2] B67D 5/22; G06M 3/06
U.S. Cl. 235—92 FL **7 Claims**



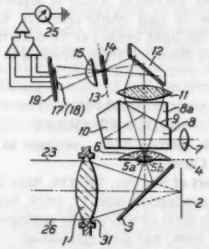
1. In a resettable fuel pump delivery register for registering the cost and volume of each fuel delivery and having a main frame with a pair of spaced generally parallel upright side frame members, at least one pair of upper and lower resettable cost and volume counters with respective banks of coaxial resettable cost and volume counter wheels of increasing order with respective coaxial wheel gears rotatable therewith, the pair of cost and volume counters being mounted on the main frame with their counter wheel banks mounted between the side frame members and with their axes generally parallel and perpendicular to the side frame members for being read from one end of the register, the improvement wherein the resettable fuel pump delivery register further comprises an elongated pulse generator bar unit having an elongated bar frame mounted on the side frame members and extending therebetween generally parallel to the axes of the cost and volume counters, first and second longitudinally extending parallel and offset drive and wheel shafts rotatably mounted on the bar frame generally parallel to the axes of the cost and volume counters, an input gear mounted at one end of the drive shaft in engagement with a wheel gear of one of the counter wheels for rotating the drive shaft by said one counter wheel, gear means mounted at the other end of the drive shaft having totalizer and pulse generator drive gears driven by the drive shaft, a rotary totalizer mounted on the bar frame having a plurality of totalizer wheel indicators of ascending order rotatably mounted on the wheel shaft for being read from said one end of the register and gear means in engagement with the totalizer drive gear for rotating the totalizer for indicating the total amount of fuel delivered, a wheel shaft drive gear mouned at one end of the wheel shaft for engagement with the pulse generator drive gear for rotating the wheel shaft therewith, and a rotary pulse generator having a rotary permanent magnet mounted at the other end of the wheel shaft for being rotated thereby and a magnetic pickup operable by the rotary permanent magnet for generating a pulse train with a pulse for each predetermined increment of rotation of the rotary permanent magnet and therefore of said one counter wheel.

4,200,786

ELECTROOPTICAL FOCUSING APPARATUS FOR PHOTOGRAPHIC CAMERAS

Werner Holle, Wetzlar, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jan. 24, 1978, Ser. No. 871,852
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703290
Int. Cl.[2] G01J 1/36
U.S. Cl. 250—204 **4 Claims**



1. In an apparatus for electrooptically focusing an objective in a single lens reflex camera having a focusing screen and a split image wedge rangefinder located along an optical axis, the improvement comprising:

said focusing screen being followed by a pentaprism along said optical axis and having a focusing window provided with said split image wedge rangefinder having two wedges (**5a**,**5b**) deflecting said optical axis, said pentaprism having a first plane reflecting surface which is partly reflecting, a scanning grating for spatial frequency filtering (**14**) and a photoelectric detector system (**17**,**18**) both mounted behind said first plane reflecting surface and along said deflected optical axis of one of said wedges (**5a**) and an optics (**11**) along said optical axis for imaging a plane of one of said wedges (**5a**) into a plane where spatial frequency filtering takes place.

4,200,787

FIBER OPTIC ELEVATION SENSING APPARATUS

William M. Carson, Marina Del Rey, Calif., assignor to CLS Industries, Inc., Los Angeles, Calif.

Filed May 30, 1978, Ser. No. 910,197
Int. Cl.[2] G01D 5/26
U.S. Cl. 250—227 **25 Claims**

1. Apparatus for sensing the elevation of a light beam transmitted from a remote location, comprising:

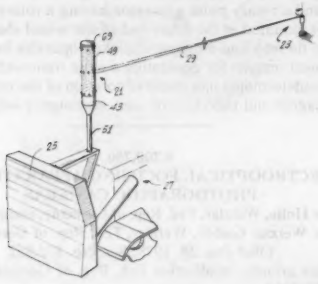
a plurality of optical fibers, each of said fibers being adapted to receive light at a receiving end and to transmit the light to a terminal end, from which it is then emitted, said optical fibers being divided into a plurality of fiber groups;

means for arranging the receiving ends of the optical fibers in each of said fiber groups in a prescribed pattern to receive light from a separate, predetermined elevation

zone and from substantially all horizontal directions within each zone;

phototransducer means having a plurality of photo-sensitive surfaces; and

means for orienting the terminal ends of the optical fibers in each of said fiber groups to direct light emitted therefrom



toward a separate one of said photo-sensitive surfaces, whereby the presence of the light beam in any one of said predetermined elevation zones is sensed by the corresponding one of said photo-sensitive surfaces and the elevation of the light beam can be determined regardless of the relative direction from which it is transmitted.

4,200,788

MODULAR ARRAY

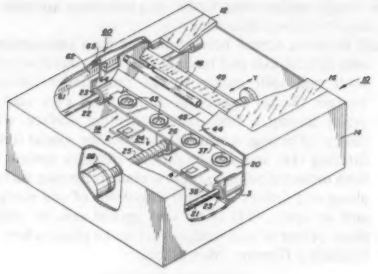
Martin A. Agulnek, Sharon, Mass., assignor to Xerox Corporation, Stamford, Conn.

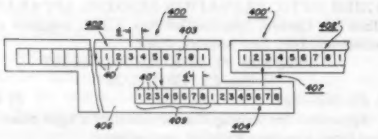
Continuation-in-part of Ser. No. 793,118, May 2, 1977, Pat. No. 4,146,786. This application Apr. 17, 1978, Ser. No. 896,860

The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.

Int. Cl.[2] H01J *3/14*

U.S. Cl. 250—235 **4 Claims**





1. An imaging array for use in a multiple imaging array structure comprising:

a. an array support,

b. means forming a first relatively long linear imaging array on said support;

c. means forming a second relatively short imaging array on said support, said second linear array being offset from and substantially parallel with said first imaging array, said second imaging array having a portion thereof overlapping one end of said first imaging array with the remainder of said second imaging array projecting beyond said first imaging array one end whereby to permit said first imaging array to be disposed in end-to-end relation with a third imaging array with the projecting portion of said second array overlapping the adjoining end of said third array to provide an uninterrupted imaging path.

4,200,789

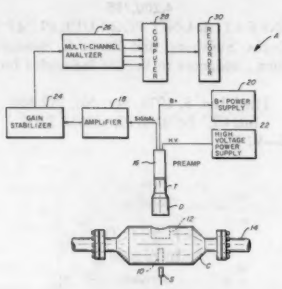
MEASURING OIL AND WATER CUTS IN A MULTIPHASE FLOWSTREAM WITH ELIMINATION OF THE EFFECTS OF GAS IN DETERMINING THE LIQUID CUTS

Dan M. Arnold, and Harry D. Smith, Jr., both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 29, 1978, Ser. No. 920,568

Int. Cl.[2] G01V *5/00*; G01N *23/00*

U.S. Cl. 250—270 **22 Claims**



1. A method for analysis of a fluid containing liquid and gas and flowing in a conduit to determine the water and oil cuts of the fluid, comprising the steps of:

(a) bombarding the fluid with fast neutrons which are slowed down and thereafter engage in thermal neutron capture reactions with materials in the fluid;

(b) obtaining gamma ray energy spectra of the materials in response to the capture of thermal neutrons by the materials in the fluid;

(c) obtaining a measure of the concentration of chlorine in the fluid from the gamma ray energy spectra;

(d) obtaining a measure of the concentration of sulfur in the fluid from the gamma ray energy spectra; and

(e) obtaining from a ratio of the concentration of sulfur to the concentration of chlorine the water and oil cuts of the fluid.

4,200,790

CLOSED-CHAMBER HIGH-PRESSURE GAS ION-FLOW ELECTRO-RADIOGRAPHY APPARATUS WITH DIRECT-CHARGE READOUT

Kei-Hsiung Yang, and Jack D. Kingsley, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,453

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—315.2 **10 Claims**

1. Apparatus for providing an image of radiation differentially-absorbed by an object, comprising:

a hollow member having first, second and third chambers in communication with one another;

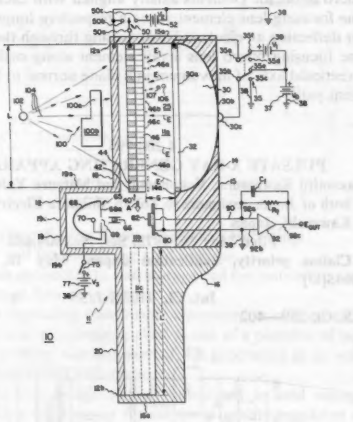
a conductive electrode forming a front portion of at least said first chamber and receiving said differentially-

absorbed radiation for transmittal therethrough into said first chamber;

a rear electrode positioned in said first chamber and substantially parallel to said front electrode and spaced therefrom in a direction away from the direction of radiation incidence;

a mesh structure initially disposed within said first chamber between said front and rear electrodes at a preselected gap distance from said rear electrode, said mesh structure being movable through said second chamber into said third chamber, said mesh structure comprising a substantially planar conductive member having a multiplicity of apertures formed therethrough; and an insulative layer supported upon a surface of said conductive member furthest from said first chamber front electrode and having a like multiplicity of apertures formed therethrough, each in registration with an aperture formed in said conductive member;

a gas filling the communicating chambers of said hollow member, said gas being characterized by absorption of quanta of said radiation and conversion of the absorbed quanta into electrically charged particles;



means coupled between at least the conductive member of said mesh structure and said first chamber rear electrode for forming an electric field in the gap therebetween for depositing the electrically charged particles formed within the gas gap, responsive to absorption in the gas of quanta of the differentially-absorbed radiation, at the insulative film with a charge pattern of a first polarity and representative of the radiation absorption characteristics of the object irradiated;

means positioned in said second chamber for directing a stream of ions of said first polarity toward said conductive member and thence through each aperture of said mesh structure for modulation of said ions by the like polarity charge deposited upon said insulative film and surrounding each said aperture; and

means for detecting the modulated ion stream emerging from each aperture of said mesh structure to provide an electrical signal of magnitude responsive to the radiation absorption characteristic of an associated portion of the object being irradiated.

4,200,791

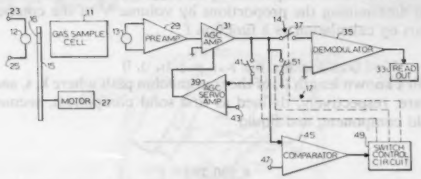
GAS ANALYZER AND GAS ANALYZING METHOD

Irvin G. Burough, Walnut Creek, Calif., assignor to Andros Incorporated, Berkeley, Calif.

Filed Oct. 11, 1978, Ser. No. 950,327

Int. Cl.[2] G01J *1/00*

U.S. Cl. 250—343 **9 Claims**



1. A method for producing synchronizing pulses in a gas analyzer having a sample cell for containing a gas mixture to be analyzed, means for producing and directing infrared energy through the sample cell, means for detecting the infrared energy passing through the sample cell and producing an electrical signal representative thereof, means coupled to the detecting means for processing the electrical signal to produce an output indicating the concentration of the constituents of the gas in the sample cell, and a rotary filter wheel for successively and repetitively positioning at least one filter in the path of the infrared energy, said method comprising detecting a preselected rising or falling portion of said electrical signal representative of the infrared energy, and developing the synchronizing signals at a fixed time relationship to said rising or falling portion.

4,200,792

METHOD OF AND APPARATUS FOR ASCERTAINING THE VOLUME COMPONENTS OF A THREE-COMPONENT MIXTURE

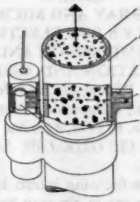
Hans-Ulrich Fanger, Reinbek; Rudolf Pepelnik, Börnsen, and Walfried Michaelis, Bullenhausen, all of Fed. Rep. of Germany, assignors to Gesellschaft für Kernenergieverwertung in Schiffbau und Schiffahrt mbH, Geesthacht-Tesperhude, Fed. Rep. of Germany

Filed May 18, 1977, Ser. No. 798,120

Claims priority, application Fed. Rep. of Germany, May 19, 1976, 2622175

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—359 **7 Claims**



1. A method of determining the proportions by volume of a three-component mixture, in which two components are substantially indistinguishable by gamma ray radiation in density and another component is substantially indistinguishable from one of the other two components by gamma ray radiation in chemical composition, comprising the steps of irradiating a flowing three-component mixture simultaneously with a first and a second gamma source having different energies, lower energy radiation from said first source being selectively absorbed by said two components differing in chemical composition, and radiation from said second source being selectively

absorbed by said two components which differ in density, transmitting said radiation a known distance 1, detecting said transmitted radiation by a common detector, analyzing signals from said detector to produce a spectrogram showing solely the proportions of the two gamma energies, then evaluating the spectrogram with regard to the two radiation transmissions (t_1, t_2) and with regard to the pairs of extinction coefficients for each of the three components (μ_{k1}, μ_{k2}), (μ_{s1}, μ_{s2}), (μ_{w1}, μ_{w2}), and determining the proportions by volume V of the components by calculation as a function f

$$V = f(\mu_{k1}, \mu_{k2}, \mu_{s1}, \mu_{s2}, \mu_{w1}, \mu_{w2}, t_1, t_2, l)$$

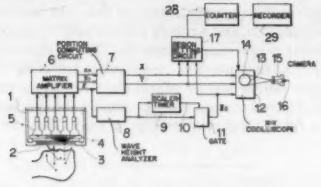
with a known length (l) of the transmission path where k, s, and w are, respectively, defined as first solid component, second solid component, and liquid.

4,200,793

DEVICE FOR SETTING REGION OF INTEREST FOR SCINTILLATION CAMERA

Yasuo Nagasawa, and Junichi Yamada, both of Kashiwa, Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 812,626
Claims priority, application Japan, Jul. 5, 1976, 51-78928
Int. Cl.[2] G01T 1/20
U.S. Cl. 250—363 S **25 Claims**



1. A device for setting a region of interest for a scintillation camera for obtaining a photographic image which is comprised of luminous spots corresponding to the positions of incident gamma rays, from coordinate signals X and Y representing the positions of the incident gamma rays and from a signal Z proportional to the energies of the incident gamma rays, wherein said device includes a circular region setting circuit for discriminating whether or not said coordinate signals are located within a predetermined region of interest by comparing the sum of the squares of the respective coordinate signals X and Y with a predetermined value.

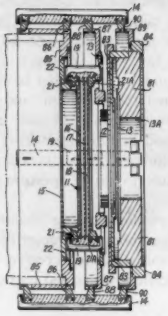
4,200,794

MICRO LENS ARRAY AND MICRO DEFLECTOR ASSEMBLY FOR FLY'S EYE ELECTRON BEAM TUBES USING SILICON COMPONENTS AND TECHNIQUES OF FABRICATION AND ASSEMBLY

Sterling P. Newberry, Winchester, and John R. Burgess, Dunstable, both of Mass., assignors to Control Data Corporation

Filed Nov. 8, 1978, Ser. No. 958,657
Int. Cl.[2] G21K 1/08, 5/00
U.S. Cl. 250—396 ML **76 Claims**

1. A combined fine focusing micro lens array and micro deflector assembly for use in electron beam tubes of the fly's eye type comprising a fine focusing micro lens array subassembly formed by at least one thin planar apertured lens plate fabricated from silicon semiconductor material and having an array of micro lens aperture openings formed therein by photolithographic semiconductor microcircuit fabrication techniques, the apertured silicon lens plate having highly conductive surfaces and being secured to glass rods for holding the lens plate in parallel spaced-apart relationship relative to the micro deflector assembly with the plane of the lens plate substantially at right angles with respect to an electron beam path passing through the assembly, the apertures in the silicon lens plate being axially aligned along respective longitudinal axes passing through the center of the respective apertures parallel to the electron beam path and comprising an array of fine focusing lens elements, said combined fine focusing micro lens array and micro deflector assembly further including a micro deflector sub-assembly mounted immediately adjacent to said fine focusing micro lens array sub-assembly and defining a honeycomb matrix of sets of orthogonally disposed micro



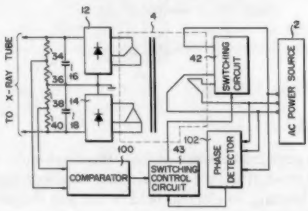
deflector elements there being a set of orthogonally disposed micro deflector elements axially aligned with each respective fine focusing lens element along a respective longitudinal axis for deflecting an electron beam passing through the respective fine focusing micro lens array element along orthogonal x-y directional axes of movement in a plane normal to the electron beam path.

4,200,795

PULSATE X-RAY GENERATING APPARATUS

Kazumitu Kawamura, Yokohama, and Mitsuru Yahata, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 16, 1978, Ser. No. 906,683
Claims priority, application Japan, May 18, 1977, 52-62645[U]
Int. Cl.[2] H05G 1/30
U.S. Cl. 250—402 **6 Claims**



1. A pulsate X-ray generating apparatus comprising:
a switching circuit for coupling to and from a power source;
a high-tension transformer having primary and secondary windings, said primary winding being coupled to said switching circuit, said transformer producing a boosted AC voltage;
a rectifier coupled to said secondary winding for rectifying said boosted AC voltage producing a DC voltage having a ripple component;
at least one high-tension capacitor coupled to said DC voltage from said rectifier;
an X-ray switch coupled to said capacitor;
an X-ray tube coupled to said X-ray switch;
a comparator coupled to said capacitor for producing a charge instruction signal as long as the detected charge

voltage of said high-tension capacitor is below a predetermined threshold level;

a phase detector for generating a pulse signal in synchronism with a given phase of said ripple component of said DC voltage; and

a switching control circuit coupled to said comparator and to said phase detector and receiving signals therefrom for producing a control signal for controlling said switching circuit, said control signal enabling said switching circuit only when both a charge instruction signal from said comparator and a pulse from said phase detector are present and maintaining the enabled condition as long as said charge instruction signal remains present.

4,200,796

STORAGE CELL TYPE X-RAY APPARATUS

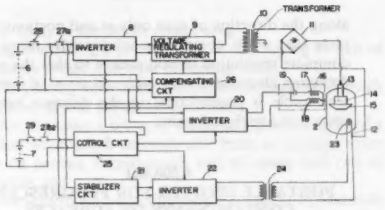
Fumio Murakami, Funabashi; Takeshi Enya, Nara, and Yoshinori Ochiai, Kashiwa, all of Japan, assignors to Hitachi Medical Corporation, Tokyo, Japan

Filed Jun. 15, 1978, Ser. No. 915,773

Claims priority, application Japan, Jun. 17, 1977, 52-71009; Jun. 17, 1977, 52-71012; Sep. 9, 1977, 52-107916

Int. Cl.[2] H05G *1/30*

U.S. Cl. 250—402 **11 Claims**



1. A storage cell type X-ray apparatus comprising:

a storage cell for producing a dc voltage;

an inverter connected to said storage cell for converting said dc voltage into an voltage;

a voltage regulating transformer connected to said inverter, having said ac voltage applied to one of a plurality of taps of the primary winding thereof, for generating an ac voltage regulated in amplitude;

a voltage step-up transformer connected to said voltage regulating transformer for stepping up said regulated ac voltage to a high ac voltage;

a rectifier connected to said voltage step-up transformer for rectifying said high ac voltage into a high dc voltage;

an X-ray tube to which said rectifier is connected for applying said high dc voltage between the anode and the cathode thereof, for emission of X-rays; and

a compensator circuit connected to said storage cell and said voltage regulating transformer for preventing a drop in said high dc voltage applied to said X-ray tube due to a drop in said dc voltage of said storage cell having a storage cell voltage detector circuit connected to said storage cell for detecting the magnitude of said dc voltage, a reference voltage generating circuit for generating a predetermined reference voltage, a comparator connected to said storage cell voltage detector circuit and said reference voltage generating circuit for generating an output when said magnitude of said dc voltage is less than said reference voltage, and a self holding relay connected to said comparator and said voltage regulating transformer actuated by said output of said comparator having contacts for continued self actuation and for changing the tap of said primary winding of said voltage regulating transformer having said dc voltage applied thereto for increasing said regulated ac voltage.

4,200,797

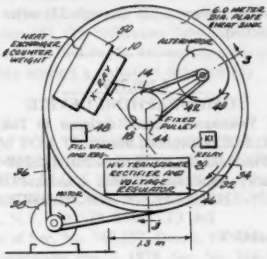
CONTINUOUSLY ROTATING CAT SCANNING APPARATUS AND METHOD

Ronald F. Bax, Columbia, Md., assignor to Pfizer Inc., New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 959,625

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—402 **38 Claims**



1. A tomographic scanner of a type which utilizes a rotating source of radiation, said scanner comprising:

a rotationally mounted support member;

drive means for rotating said support member;

an electrically activated source of radiation mounted for rotation with said support member; and

conversion means also mounted for rotation with said support member for converting at least some of the inertial mechanical energy of the rotating apparatus into electrical energy sufficient to activate said source of radiation during a scan cycle of the tomographic scanner.

4,200,798

DENTAL X-RAY DIAGNOSTIC APPARATUS

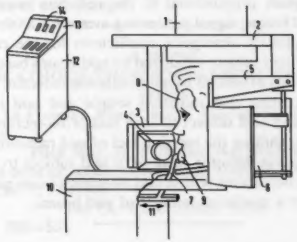
Manfred Neuendorf, Lorsch; Ernst Schmitt, Bensheim, and Gustav Schubert, Lorsch, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 7, 1978, Ser. No. 967,363

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758191

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—439 P **9 Claims**



1. A dental x-ray diagnostic apparatus having a unit which can be rotated about vertical axes, essentially comprising an x-ray tube and a film carrier, and a head support arranged therebetween used for the support of the patient's head, said head support being adjustably arranged in a horizontal plane relative to a mounting therefor in order to provide a better positioning for various object exposures in different positions, characterized in that position selectors (29 through 31) for respective adjustable positions (I, II, III) of the head support (7) have respective display elements (35 through 37), an index

field (14) being marked (at I, II, III, FIG. 3) according to the various object exposures, that each position can be selected by a respective corresponding position selector (29 through 31) arranged in the index field (14), and that a scanning means (19 through 25) having signal indicators (23, 24, 25) is coupled with the position selectors (29, 30, 31) for automatically positioning the head support (7) relative to its mounting (10) and for supplying a signal to a respective display element (35 through 37) arranged in the index field (14) and assigned to the respective position selector (29 through 31) when the selected position is reached.

4,200,799

TOMOGRAPHING DEVICE

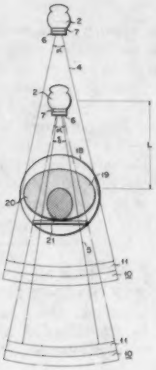
Kiyoto Saito, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 13, 1977, Ser. No. 815,360

Claims priority, application Japan, Jul. 15, 1976, 51/84107; Oct. 8, 1976, 51/121012; Dec. 28, 1976, 51/160211

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **17 Claims**



1. A computed tomography scanner comprising a radiation source for irradiating a subject with a diverging pattern of beams of penetrating radiation; a radiation detector disposed opposite to said radiation source with the subject therebetween to detect the radiation penetrating said subject and to generate electrical signals proportional to the radiation intensity detected in said beams; signal processing means for analyzing the pattern of radiation absorption coefficients for the cross-sectional area of said subject irradiated by said beams based on the electrical signals produced by said radiation detector; rotation means for rotating said radiation source and said radiation detector around said subject to scan said cross-sectional area; and means for shifting the rotation loci of said radiation source and said radiation detector relative to said subject to position said cross-sectional area within said diverging beam pattern so as to intersect a maximum number of said beams.

4,200,800

REDUCED DOSE CT SCANNING

Roderick D. Swift, Belmont, Mass., assignor to American Science & Engineering, Inc., Cambridge, Mass.

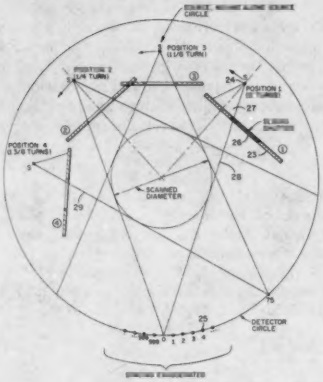
Filed Nov. 3, 1977, Ser. No. 848,144

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—445 T **20 Claims**

1. In a CT scanner having a fixed circular array of contiguous detectors extending about substantially the entire circumference of a circular path and a source of a fan beam of penetrating radiant energy relatively movable with respect to the detectors about an axis in a region to be scanned within said circular path, the improvement comprising,

means for passing a substantially constant width of said fan beam during substantially one complete revolution of said source and for variably limiting the width of said fan beam



along the direction of scan only at end portions of a complete scan cycle comprising substantially more than one complete revolution of said source so that the number of detectors illuminated near each end point of the complete scan cycle is proportional to the distance between the source and each end point.

4,200,801

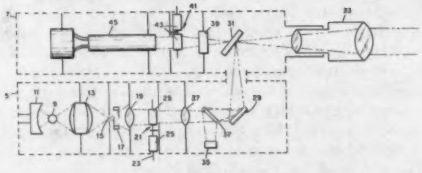
PORTABLE SPOTTER FOR FLUORESCENT CONTAMINANTS ON SURFACES

Daniel D. Schuresko, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 28, 1979, Ser. No. 24,803

Int. Cl.[2] F21K *2/02*

U.S. Cl. 250—458 **6 Claims**



1. A fluorescence sensitive spotter for detecting fluorescent contaminant materials on a surface comprising:

a fluorescence exciting light source means for directing a beam of said fluorescence exciting light onto said surface and material;

means including a reference signal generator for modulating said light source beam at the frequency of said reference signal which differs substantially from frequency of variation of extraneous background light reflected from said surface;

light detecting means for detecting the fluorescence emission induced by said modulated light source and background light from said surface and generating an electrical signal in response thereto; and

phase sensitive detection means responsive to the phase relationship between the detected fluorescence signals from said materials and said reference signal for separately detecting fluorescence signals from different types of said

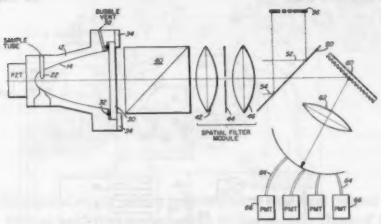
materials each in the presence of the other which fluoresce at substantially the same fluorescence light wavelength but differ in fluorescence lifetimes.

4,200,802

PARABOLIC CELL ANALYZER

Gary C. Salzman, and Mary J. Skogen Hagenson, both of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 28, 1979, Ser. No. 24,762
Int. Cl.² G01N *21/38*
U.S. Cl. 250—461 B **10 Claims**



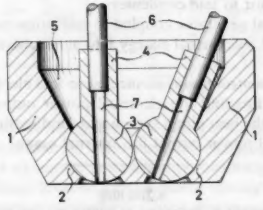
7. A cell analysis apparatus comprising:
a housing containing a paraboloidal cavity having an axis of rotation, a focus, and light reflecting walls;
means for passing cells to be analyzed substantially through said focus of said paraboloidal cavity;
means for directing a beam of essentially parallel light of a selected wavelength through said focus to impinge upon any cell passing therethrough and to cause said cell to fluoresce; and
means for selectively collecting light fluoresced by said cells passing through said beam at said focus to determine therefrom certain cellular characteristics.

4,200,803

MULTIPLE COLLIMATOR APPARATUS WITH ANGULARLY ADJUSTABLE COLLIMATOR TUBES

Veit Becker; Ludwig Feinendegen, and Max Pollermann, all of Jülich, Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Apr. 5, 1978, Ser. No. 893,784
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1977, 2715364; Mar. 7, 1978, 2809679
Int. Cl.² G21F *5/04*
U.S. Cl. 250—505 **7 Claims**



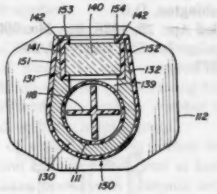
1. A multiple collimator comprising:
a thick shield plate member opaque to penetrative radiation (1);
a plurality of bores traversing said shield plate and so shaped as to provide a frustoconically shaped cavity surface;
a rotatable body (9) of material opaque to penetrative radiation rotatably mounted in each of said bores having a frustoconical surface fitting the frustoconical surface of the bore, and having also a cavity for mounting, at an adjustable angle to the axis of said rotary body, a collimator tube body, said cavity being open through the end faces of said rotary body, and
a collimator tube body (*4a*, *4b*) of material opaque to penetrative radiation having a collimator tube bore therethrough and movably mounted in said cavity of each of sair rotary bodies so as to permit variation of the angular position of said collimator tube bore with respect to said shield plate (1), the collimator tube bore of each of said collimator tube bodies (*4a*, *4b*) having a portion shaped for removably seating a radiation detector (6).

4,200,804

SYSTEM FOR TRANSPORTING, STORING AND INJECTING RADIOISOTOPE-CONTAINING FLUIDS

Ralph Farella, Scarsdale, N.Y.; Barry Dansky, Fairfield, Conn., and Leonard Epifano, Rye, N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Continuation of Ser. No. 747,557, Dec. 6, 1976, abandoned. This application Jun. 9, 1978, Ser. No. 914,171
Int. Cl.² G21F *5/00*; G01N *21/24*
U.S. Cl. 250—506 **25 Claims**



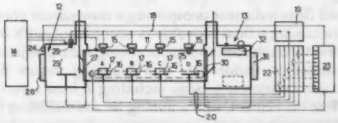
1. A system for transporting, storing and injecting radioactive material, comprising:
a syringe body including a barrel and a plunger slideable in said barrel, said plunger extending from the rear of said barrel for manual actuation;
a body of radiation-shielding material substantially covering said barrel, said body having a slot therein;
a radiation-shielding unit removably mounted over said slot;
an aliquot of radioisotope-containing fluid contained in said barrel; and
manually disengageable means for preventing a forward stroke of said plunger.

4,200,805

MULTICATHODE THERMOCHEMICAL PROCESSING OVEN

Philippe Le Francois, Place Charles Andrieu, Neuilly-en-Thelle, France

Filed Mar. 21, 1978, Ser. No. 888,536
Claims priority, application France, Mar. 23, 1977, 77 08686; Sep. 14, 1977, 77 27785
Int. Cl.² C23C *11/00, 11/14*
U.S. Cl. 250—531 **22 Claims**



1. A multicathode thermochemical processing oven for the treatment of different types of metal selected from the group

consisting of steel and steel alloys, simultaneously and in the same oven by the ionic bombardment thereof, comprising:

an air-tight enclosure containing at least one anode, at least two individually operable cathodes spaced from and operatively associated with said one anode to form at least two separate anode-cathode couples independent from each other without interacting with each other and a processing gas for supplying ions maintained at a very low pressure;

a high voltage power source having a pair of terminals, said anode being connected to one of said terminals, each said anode-cathode couples including separate switching circuits and separate circuits for connection to said high voltage power source; and,

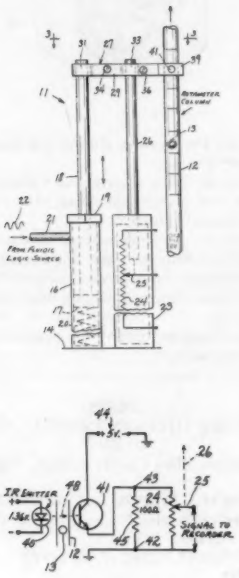
an individual and separate switching and arcbreaking assembly for each said cathode, each said assembly connecting its said associated cathode to the other of said terminals, and wherein the metals to be treated can be set out individually on individual ones of said cathodes and treated as a group while imparting different treatments to each of the metals placed onto said cathodes.

4,200,806

SCANNING FLOW INDICATOR FOR ROTAMETERS

Elijah C. Walker, Takoma Park, and Horace E. Cascio, Hyattsville, both of Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Apr. 25, 1978, Ser. No. 900,641
Int. Cl.[2] G01N 21/26
U.S. Cl. 250—577 **11 Claims**



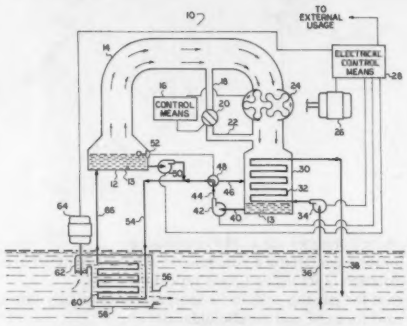
1. A fluid flow indicator comprising a transparent rotameter column containing a float movable in accordance with the rate of fluid flow through the column, scanning means adjacent the column, means to reciprocate said scanning means linearly parallel to said column in a range including at least a part of the range of float movement, said scanning means including photoelectric float-sensing means, potentiometer means including a movable contact, means to move said contact synchronously with the scanning means, a current source, circuit means connecting said current source to said potentiometer means so as to generate an analog signal at said contact varying synchronously with the movement of said scanning means, and means causing a relatively abrupt change in said analog signal responsive to the sensing of said float by said photoelectric sensing means.

4,200,807

METHOD OF ELECTRICAL CLOSED HEAT PUMP SYSTEM FOR PRODUCING ELECTRICAL POWER

Gerald F. Humiston, Apt. E 202, 2909 Gulf to Bay Blvd., Clearwater, Fla. 33519

Filed Sep. 15, 1977, Ser. No. 833,664
Int. Cl.[2] H02P 9/04
U.S. Cl. 290—1 R **11 Claims**



1. A heat pump system for producing electrical power, comprising in combination:

a heat pump for a first fluid comprising an evaporator and a condenser interconnected by a conduit;

a closed evaporator heat exchanger disposed remote from said evaporator and in thermal contact with a warm second fluid and connected to said evaporator for heating the first fluid in said evaporator;

a closed condenser heat exchanger disposed in thermal contact with said condenser for absorbing heat from the condensing first fluid;

means for introducing a cold third fluid remote from said condenser into said closed condenser heat exchanger for condensing the first fluid;

condenser return conduit means connecting said condenser to said evaporator and extending through said closed evaporator heat exchanger for heating the condensed first fluid prior to introduction into said evaporator;

a prime mover interposed in said conduit for providing mechanical energy from the mass flow of vapor from said evaporator to said condenser;

an electrical generator coupled to said prime mover to convert said mechanical energy into an electrical power output; and

electrical control means connected to said electrical generator for directing the electrical power output thereof to operate the heat pump system and for directing any excess electrical power output for external usage.

4,200,808

CONTINUOUSLY TUNABLE WIDEBAND COHERENT INFRARED SOURCE

Richard L. Herbst, Menlo Park, Calif., assignor to Quanta-Ray, Inc., Mountain View, Calif.

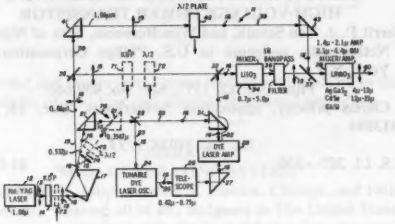
Filed Jan. 30, 1978, Ser. No. 873,205
Int. Cl.[2] H03F 7/04
U.S. Cl. 307—425 **7 Claims**

1. In a tunable wideband infrared source:

first laser means for generating first output optical radiation at a first wavelength;

multiplier means responsive to said first output optical radiation for generating second coherent output radiation at a second wavelength which is shorter than said first wavelength;

dye laser means responsive to said second output coherent optical radiation for producing third output coherent optical radiation which is continuously tunable over a band of third wavelengths;



first crystal mixer means responsive to said first output radiation at said first wavelength or harmonics thereof and to said third output optical radiation for producing fourth output optical radiation which is responsive to the tuning of said third output radiation for tuning over a band of fourth wavelengths; and

second crystal mixer means responsive to said first output radiation and to said fourth output optical radiation for producing fifth output optical radiation which is responsive to the tuning of said fourth output radiation for tuning over a band of fifth wavelengths in the infrared band.

4,200,809

APPARATUS FOR GENERATING ELECTRIC SHOCK PULSES

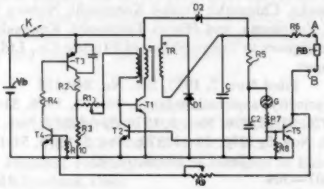
Birger B. Madsen, Rungsted Kyst, Denmark, assignor to Reofon A/S, Gentofte, Denmark

Filed Jun. 27, 1978, Ser. No. 919,603

Claims priority, application Denmark, Jun. 29, 1977, 2917/77

Int. Cl.[2] H05C *1/06*

U.S. Cl. 307—132 R **7 Claims**



1. An apparatus for generating electric shock pulses comprising a power source; a generator for charging a capacitor; and a control circuit for controlling the discharge at a predetermined voltage level of said capacitor through a discharge circuit including a controllable switch device and at least two output terminals, CHARACTERIZED by further comprising a detector circuit connected and arranged in such a manner that a detector current will flow from said power source and through an external load as soon as such a load occurs across said output terminals, said detector circuit comprising means which, responsive to said detector current, provide a starting signal for rendering said charging generator operative.

4,200,810

METHOD AND APPARATUS FOR AVERAGING AND STRETCHING PERIODIC SIGNALS

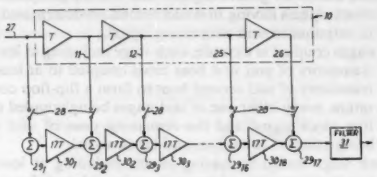
Gerald D. Cain, London; James E. Dilley, Leighton Buzzard, and Richard C. S. Morling, London, all of England, assignors to National Research Development Corporation, London, England

Filed Feb. 17, 1978, Ser. No. 878,964

Claims priority, application United Kingdom, Feb. 22, 1977, 7426/77

Int. Cl.[2] H03K *5/159*; H04J *3/18*

U.S. Cl. 307—221 D **13 Claims**



1. Signal processing apparatus for processing a periodic input signal, the apparatus comprising:

(a) common input terminal means to which said periodic input signal is applied;

(b) common output terminal means;

(c) a plurality of different delay paths coupling said common input terminal means to said common output terminal means, said different delay paths having respective different delays differing by a whole number multipl. of the period of said periodic input signal;

(d) a plurality of signal summing means included in said delay paths and arranged such that at least some of said delay paths have portions in common with one another downstream of the respective summing means;

(e) sampling means in each said delay path; and

(f) clock means coupled to said sampling means for driving said sampling means at a sampling interval which is greater than said period and is a non-integer multiple of said period.

4,200,811

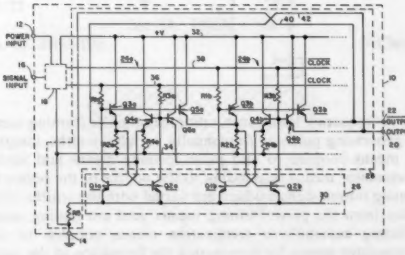
FREQUENCY DIVIDER CIRCUIT

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 11, 1978, Ser. No. 904,849

Int. Cl.[2] H03K *23/08*

U.S. Cl. 307—225 R **10 Claims**



1. An integrated circuit for dividing the frequency of an alternating signal by a number n, at least equal to two, comprising:

a substrate of a first type of semiconductor material;

first and second boats of a second type of semiconductor

material formed on said substrate, said first and second boats divided by an area of said first type of semiconductor material;

a first plurality of bipolar transistors having base, emitter and collector regions formed in said first boat, said first plurality of transistors sharing a common emitter region;

a second plurality of bipolar transistors having base, emitter and collector regions formed in said second boat, said second plurality of transistors sharing a common collector region;

first and second sources of operating potential, said first source of operating potential coupled to said common collector region of said second boat;

clock means for generating first and second complementary clock signals having first and second predetermined levels in response to said alternating signal;

n stages coupled in cascade, each stage including at least two transistors of said first boat cross coupled to at least two transistors of said second boat to form a flip-flop configuration, every other one of said stages being coupled to said first clock signal and the remaining ones of said stages being coupled to said second clock signal;

each stage including biasing means including at least said two transistors of said second boat in said stage for causing only one of said two transistors of said first boat in said stage to be conductive of a current less than its saturation current and the other one of said two transistors of said first boat in said stage to be nonconductive independent of the level of the associated one of said first and second clock signals; and

coupling means for coupling signals representing the conductive state of said two transistors of said first boat in said stage to the next stage in response to one of said predetermined levels of the associated one of said first and second clock signals, said two transistors of said first boat of said next stage changing conductive stages in response thereto.

4,200,812

FREQUENCY CONVERTER DELIVERING CONSTANT WIDTH OUTPUT PULSES WITHIN VARIABLE DUTY CYCLES

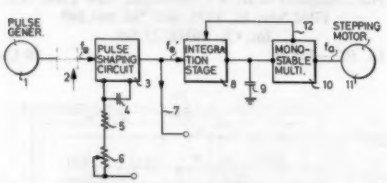
Manfred Fichter, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Filed Jan. 12, 1978, Ser. No. 868,863

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1977, 2701575

Int. Cl.[2] H03K *1/18, 4/02, 25/06*

U.S. Cl. 307—265 **4 Claims**



1. A frequency transducer, comprising: pulse forming means for generating pulses with manually variable widths, integrating means coupled to said pulse forming means and having accumulator means responding to the widths of the pulses for forming output signals which are varied with the widths of the pulses from the pulse forming means, said integrating means including accumulator termination means coupled to said accumulator means for terminating the formation of the signal and reducing the value of the signal to an initial value when the termination means is actuated, monostable switching means coupled to said accumulator means for producing a pulse in response to the signal reaching a predetermined value, said switching means having an output connected to said termination means for actuating said termination means and returning the signal to an initial value, said pulse forming means producing pulses of one frequency and said switching means producing pulses of another frequency on the basis of the pulse widths, said switching means including a monostable multivibrator with an input and an output and further including an ultra-high resistance trigger stage connected between the input to the monostable multivibrator and the output of said integrating means.

4,200,813

CIRCUIT ARRANGEMENT COMPRISING A HIGH-VOLTAGE POWER TRANSISTOR

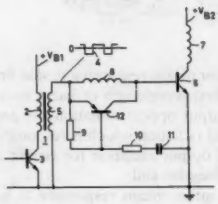
Gerrit P. J. Van Schaik, and Wim Bosboom, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 12, 1977, Ser. No. 859,660

Claims priority, application Netherlands, Dec. 15, 1976, 7613894

Int. Cl.[2] H03K *3/33*

U.S. Cl. 307—300 **14 Claims**



1. A circuit arrangement comprising a high-voltage power transistor having a base-emitter circuit and a collector layer, an inductor, control means connected through the inductor to the base-emitter circuit of the transistor for supplying a pulse-shaped switching signal thereto so as to drive the transistor between the saturation and cut-off states, a load impedance connected to the collector of the transistor and to a supply voltage source so that the current supplied by the voltage source to the collector of the transistor in the saturation state is interrupted under the influence of the pulse-shaped switching signal, and a controllable switch connected in parallel with the inductor so as to briefly short-circuit said inductor at switch-on of the transistor.

4,200,814

MULTIPLIER WITH HALL ELEMENT

Shikei Tanaka, Chigasaki; Tetsuji Kobayashi; Noboru Matsuo, both of Yokohama, and Haruo Takahashi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 7, 1977, Ser. No. 849,416

Claims priority, application Japan, Nov. 5, 1976, 51-132875; Nov. 5, 1976, 51-132876; Nov. 5, 1976, 51-132877; Nov. 5, 1976, 51-132878; Nov. 5, 1976, 51-132879; Nov. 5, 1976, 51-132881

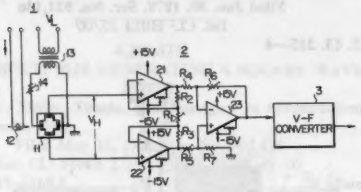
Int. Cl.[2] H03K *17/90*

U.S. Cl. 307—309 **16 Claims**

1. A multiplier comprising: a power-voltage converter including at least one Hall element with a pair of control current input terminals and a pair of Hall output voltage terminals, means for converting input current into magnetic field and applying the magnetic field onto said Hall element and means for converting input voltage to be multiplied by the input current into control current and for feeding the control current to said control current input terminals; and a differential amplifier circuit in which in-phase components in the output voltage fed from said power-voltage converter are removed and amplified;

wherein said differential amplifier comprises first and second operational amplifiers with non-inverted input terminals

connected to said pair of Hall output voltage terminals, respectively, and a third operational amplifier with in-



verted and non-inverted input terminals connecting to the outputs of said first and second operational amplifiers.

4,200,815

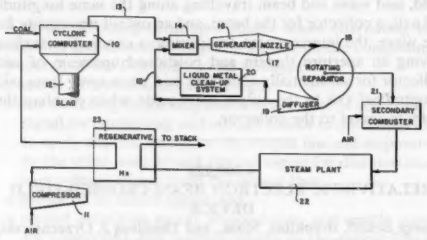
MHD GENERATING SYSTEM

Michael Petrick, Joliet; Edward S. Pierson, Chicago, and Felix Schreiner, Mokena, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,827

Int. Cl.² H02N *4/02*

U.S. Cl. 310—11 **5 Claims**



1. An open-cycle coal-fired MHD generating system comprising an MHD generator, means for combusting coal, a mixer for mixing molten copper or copper alloy with coal combustion gases to form a two-phase fluid, means for feeding said twophase fluid as working fluid to the MHD generator, means for separating molten copper or copper alloy from the gas stream after leaving the MHD generator, means for returning the molten copper or copper alloy to the mixer, and means for obtaining additional energy from the gas stream prior to exhausting said stream to the atmosphere.

4,200,816

WHEEL SPEED SENSOR INCLUDING ELECTRO-MAGNETIC PICKUP

Gary L. Hopkins, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 11, 1978, Ser. No. 905,024

Int. Cl.² H02K *19/24*

U.S. Cl. 310—168 **4 Claims**

1. In a rotation indication system for generating signals in response to relative rotation of two parts of a body, said system including:

a rotor fixedly mountable on one of said body parts and having a plurality of surface interruptions circumferentially arranged thereon,

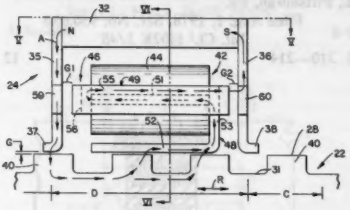
sensing means fixedly mountable near said rotor on the other said body part for relative rotation between said rotor and sensing means in response to said relative rotation of said two body parts, the improvement wherein said sensing means comprises:

a coil for generating an electrical signal variable with variations in the magnetic flux through said coil;

first and second pole members opposed to the portion of said rotor having said surface interruptions;

means for supplying magnetic flux through said pole members and rotor, in which said first and second pole members connect to opposite polarity portions of said magnetic flux supply means, one said pole member opposing a said surface interruption while the other said pole member opposes the rotor surface between said surface interruptions, and vice versa;

flux transfer means for routing the magnetic flux along a path through said coil in one direction when the surface interruptions of the rotor are in a first angular position with respect to said pole members and through the coil in



the opposite direction when said surface interruptions are in a second angular position which is advanced from said first position by a distance of approximately one-half the circumferential spacing between the centers of adjacent surface interruptions, said flux transfer means including a third pole member continuously opposing said rotor in a magnetic flux transferring relation which is substantially independent of the angular position of said surface interruptions, core means adjacent said coil for inducing an electric signal in said coil dependent on the direction of flux in said third pole member, and shunt means connected with said third pole member and core means, said shunt means lying adjacent opposite magnetic polarity portions of said magnetic flux supply means in magnetic flux transferring relation therewith.

4,200,817

Δ-CONNECTED, TWO-LAYER, THREE-PHASE WINDING FOR AN ELECTRICAL MACHINE

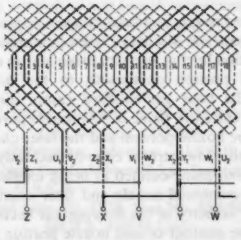
Tihomir Bratoljic, Wettengen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Jan. 5, 1978, Ser. No. 866,960

Claims priority, application Switzerland, Jan. 20, 1977, 699/77

Int. Cl.² H02K *3/00*

U.S. Cl. 310—198 **7 Claims**



1. A delta connected, two-layer, three-phase multiple winding for electrical machines, especially superconducting machines, with at least two sets of coils per phase connected in

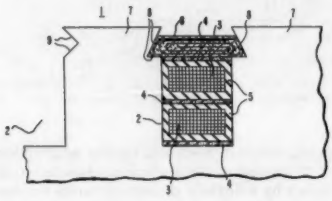
shunt, the winding being arranged on the machines such that the coils of one set are crossconnected and the coils of the other set are uncrossed, and the coil end overhangs of the crossed set are longer than the overhangs of the uncrossed set, wherein the voltage difference between conductor rods disposed in the same radial layer of any two adjacent stator slots is at most equal to one winding voltage during operation of the machine.

4,200,818

RESIN IMPREGNATED AROMATIC POLYAMIDE COVERED GLASS BASED SLOT WEDGE FOR LARGE DYNAMOELECTRIC MACHINES

Charles R. Ruffing, Edgewood Borough, Pa.; Smith A. Gause, Hampton, S.C.; John C. Botts, LaGrange, Ga., and Harry E. Smith, Varnville, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 1, 1978, Ser. No. 930,090
Int. Cl.[2] H02K *3/48*
U.S. Cl. 310—214 **12 Claims**



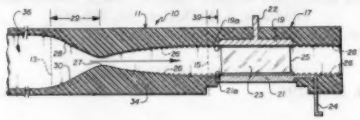
1. An iron engaging slot wedge adapted to be positioned in the coil slots of a dynamoelectric machine comprising a glass fiber core impregnated with a cured thermoset resin, and covered, on at least two sides, with a facing layer of a mat of aromatic polyamide fiber, impregnated with a cured thermoset resin.

4,200,819

UNITARY SUPERSONIC ELECTRICAL DISCHARGE LASER NOZZLE-CHANNEL

Ralph L. Haslund, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 21, 1977, Ser. No. 835,196
Int. Cl.[2] H01J *1/88, 61/28;* H01S *3/03*
U.S. Cl. 313—148 **13 Claims**



1. A combined nozzle and laser channel apparatus for use in a supersonic electrical discharge laser, comprising:

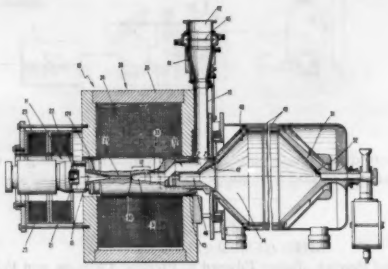
a nozzle portion having an entry plane and an exit plane, and a channel portion contiguous to the nozzle portion, wherein the laser gas mixture enters the nozzle/laser channel at the entry plane of said nozzle portion and flows through the nozzle portion and the laser channel portion, exiting at the downstream edge of said laser channel portion, said exit plane defined as being located at the point along the combined nozzle and laser channel apparatus where the velocity of the flowing gas becomes constant, wherein the contour of said nozzle portion is curved and extends downstream of the exit plane into said laser channel portion a distance equal to one-half of the height of said nozzle portion at the exit plane.

4,200,820

HIGH POWER ELECTRON BEAM GYRO DEVICE

Robert S. Symons, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 30, 1978, Ser. No. 921,136
Int. Cl.[2] H01J *25/00*
U.S. Cl. 315—4 **18 Claims**



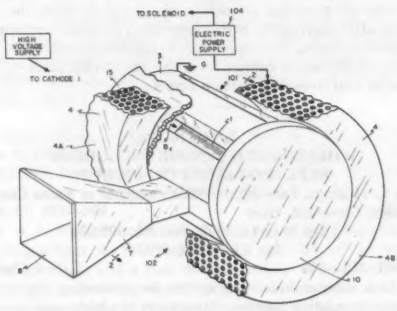
1. A high power gyro device wherein beam electrons follow helical paths imposed by a DC magnetic field and the angular velocity is modulated as the beam passes through an oscillating r.f. field of an interaction region so that a high power electromagnetic wave generally of TE modes is established in the region as a result of an interaction between the beam and the field, said wave and beam travelling along the same longitudinal axis, a collector for the beam, and an output waveguide for the wave, the improvement comprising: a conductive surface having an aperture therein and positioned upstream of said collector for substantially reflecting said wave away from said longitudinal axis to the output waveguide while enabling the beam to travel to the collector.

4,200,821

RELATIVISTIC ELECTRON BEAM CROSSED-FIELD DEVICE

George Bekefi, Brookline, Mass., and Thaddeus J. Orzechowski, Livermore, Calif., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 17, 1977, Ser. No. 778,392
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.51 **10 Claims**



1. An intense relativistic electron crossed-field magnetron device that comprises, in combination: a cylindrical field emission cathode capable of providing extremely high electron current densities; an anode which also serves as a slow wave structure, said anode comprising a plurality of axially-symmetric, periodic, circumferentially-spaced cavities distributed along a circular path, said cavities serving to bunch electrons in the form of spokes that rotate around the axis of symmetry

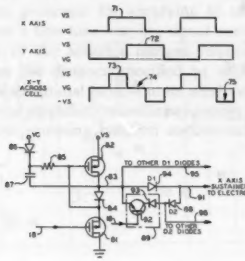
in an operating device, the rotating bunched electrons acting to induce electromagnetic fields in the cavities; means to create a magnetic field in the region between the cathode and the anode; and means to couple out electromagnetic radiation from the cavities.

4,200,822

MOS CIRCUIT FOR GENERATING A SQUARE WAVE FORM

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 15, 1978, Ser. No. 905,620
Int. Cl.[2] H04B *37/00*; H05B *39/00, 41/00*
U.S. Cl. 315—169.4 **10 Claims**



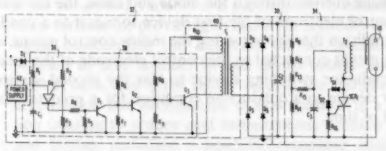
1. A circuit for generating a square wave alternating between first and second voltages on an output line comprising:
a source of the first and second voltages;
a source of a two state control signal;
a first switching means responsive to one state of said control signal for connecting said voltage source to the output line to apply the first voltage to the output line and responsive to the other state of said control signal for disconnecting said voltage source from the output line;
a source of an enable signal; and
a second switching means responsive to said enable signal for connecting said voltage source to the output line to apply the second voltage to the output line and responsive to the application of the first voltage to the output line for disconnecting said voltage source from the output line.

4,200,823

STROBE LAMP WARNING APPARATUS

William C. Keeran, Evanston, and Edward Lakickas, Chicago, both of Ill., assignors to Safety Products, Chicago, Ill.

Filed Mar. 15, 1978, Ser. No. 886,889
Int. Cl.[2] H05B *41/34*
U.S. Cl. 315—241 R **23 Claims**



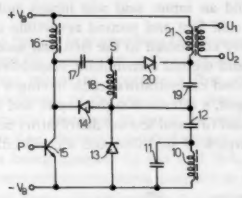
1. Apparatus for the control of energization of a cyclically illuminated warning lamp which is energized for a first predetermined time period during each cycle of operation of the lamp and de-energized for a second predetermined time period during each cycle of operation of the lamp, said apparatus comprising:
capacitive discharge means for storing electric energy and releasing the stored electric energy to energize the warning lamp;
circuit means for providing electric energy to said capacitive discharge means; and
timing circuit means for actuating said energy providing circuit means during said first predetermined time period in which the warning lamp is energized and for deactuating said energy providing circuit means during said second predetermined time period when the warning lamp is deenergized during each cycle of operation of the lamp.

4,200,824

CIRCUIT FOR PROVIDING SAW-TOOTH CURRENT IN A COIL

Attilio Farina, and Giuseppe Zappala, both of Turin, Italy, assignors to Indesit Industria Elettrodomestici Italiana S.p.A., Turin, Italy

Filed Apr. 11, 1978, Ser. No. 895,414
Claims priority, application Italy, May 4, 1977, 67991 A/77
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—408 **8 Claims**



1. In a circuit for providing saw-tooth current, with a trace and a retrace interval, in a coil, in particular a deflection coil of a television kinescope, in which the said coil is connected to a retrace condenser and a trace condenser so as to form a deflection circuit which oscillates freely during the retrace interval; in which a first diode is connected parallel to the said deflection circuit with such polarity as to be made conductive by the saw-tooth current during the first part of the trace interval; in which the said deflection circuit is also connected parallel, by means of a second diode having such polarity as to be made conductive by the saw-tooth current during a second part of the trace interval, to a controllable switch, with a control electrode, connected to a source of periodic control signals which make it conductive during part of the trace interval; and, finally, in which the said controllable switch is connected by means of a first inductor, to a supply voltage source so that, for each period of said saw-tooth current, during the interval in which the said switch is conductive energy is stored in the said first inductor and later transferred, during the interval in which the said switch is non-conductive, partly to the said deflection circuit by means of a third diode, and partly to a first condenser connected directly at one side to a common junction of said switch, said second diode and said first inductor and connected directly at the other side to said third diode, the improvement wherein energy restoring means are provided, operative in the non-conductive interval of said switch subsequent to the transfer of said energy to said first condenser, for restoring the energy transferred to said first condenser to said supply means.

4,200,825

DIGITAL CONTROL DEVICE FOR THYRISTOL-PULSE D.C. REGULATORS

Anatoly Y. Kalinichenko, Moscow, U.S.S.R., assignor to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia, Moscow, U.S.S.R.

Filed Mar. 23, 1978, Ser. No. 889,543
Int. Cl.[2] G05B *5/00*
U.S. Cl. 318—312 **1 Claim**

1. A digital control device for controlling thyristor-pulse d.c. regulators, comprising:

a master oscillator having a reset input and an output;

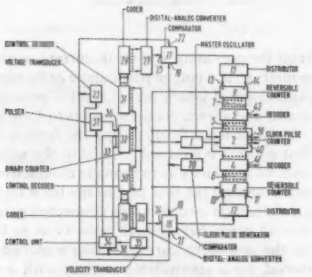
a clock pulse counter having a reset input, a control input, a multidigit logic output, and control outputs connected to main thyristors of respective regulators, said output of said master oscillator being connected to said control input of said clock pulse counter;

first and second matching decoders, each having a multidigit logic input, a control output, and a multidigit information input, said multidigit logic output of said clock pulse counter being connected to said multidigit logic inputs of said first and second matching decoders, said control outputs of said matching decoders being connected to switching thyristors of respective regulators;

first and second reversible counters, each having a multidigit output, add and subtract inputs, and a reset input, said multidigit information inputs of said first and second matching decoders being connected to the multidigit outputs of said first and second reversible counters, respectively;

first and second distributors, each having first and second outputs and an input, said add inputs and said subtract inputs of said first and second reversible counters being respectively connected to the first and second outputs of said first and second distributors, respectively;

first and second comparators, each having a clock input, a control input, a reference signal input, and an output, said inputs of said first and second distributors being connected to said outputs of said first and second comparators, respectively;



a clock pulse generator having a reset input and an output connected to said clock inputs of said comparators;

a voltage transducer having a reset input and an output connected to said reference signal inputs of said comparators;

first and second coders, each having a multidigit input and a multidigit output;

first and second digital-analog converters, each having an output and a multidigit input, said outputs of said first and second digital-analog converters being connected to said control inputs of said first and second comparators, respectively, and said multidigit inputs of said converters being connected to said multidigit outputs of said first and second coders, respectively;

first and second control decoders, each having a multidigit input and a multidigit output, said multidigit outputs of said first and second control decoders being connected to said multidigit inputs of said coders, respectively;

a binary counter having a multidigit output, a multidigit input, and a single-digit input, said multidigit inputs of said first and second control decoders being connected to said multidigit output of said binary counter;

a control unit having a multidigit output connected to said multidigit input of said binary counter, a reset output connected to said reset inputs of said voltage transducer, said reversible counters, said clock pulse counter, said master oscillator, and said clock pulse generator, and an input;

a pulser having a reset input connected to said reset output of said control unit and an output connected to said single-digit input of said binary counter; and

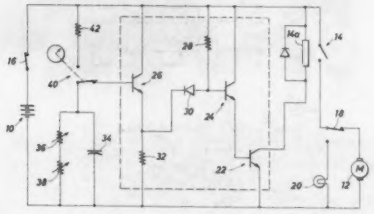
a velocity transducer having an output connected to said input of said control unit.

4,200,826

TIMING CIRCUIT FOR GAME FEEDER

Joseph C. Calusio, Kingsville, Tex., assignor to Lehman H. Feeder & Plow, Inc., Corpus Christie, Tex.

Filed Mar. 26, 1979, Ser. No. 23,742
Int. Cl.[2] H01H *7/00, 43/00*
U.S. Cl. 318—484 **9 Claims**



1. In a feeder for distributing feed at a preselected time or times during the day having an electric motor for operating the feeder, power supply means for providing electrical energy to operate the motor, and clock means for actuating a timing circuit for operating the electric motor for a limited period of time, including the improvement comprising motor control means for connecting the motor to the power supply means when the motor control means is in a conductive condition; first and second semiconductor switching devices connected to said motor control means and controlling the same to a conductive condition to energize the motor when the semiconductor switching devices are in a conductive condition; said semiconductor devices having input, output, and control electrodes, with the input electrodes of both devices connected to power supply means, the output of the first connected to the motor control means, the control electrode of the first connected to the power supply means through a resistance and to the output of the second semiconductor switching device and ground through a diode arranged to prevent current flow from the output of the second device to the control electrode of the first while allowing current leakage through the resistor to ground to prevent the current flowing through the resistor to the control electrode of the first device from biasing the first device to a conductive condition until the second semiconductor device is biased to a conductive condition to stop the flow of leakage current through the diode and cause the current to the control electrode of the first device to bias it to a conductive condition thereby actuating the motor control means, and timing means connected to the control electrode of the second semiconductor switching device to bias the second semiconductor device to a conductive condition for a predetermined period of time.

4,200,827

POSITIONING SYSTEM EMPLOYING FEEDFORWARD AND FEEDBACK CONTROL

Richard K. Oswald, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,350
Int. Cl.[2] G05B *13/00*
U.S. Cl. 318—561 **13 Claims**

1. A position control system for moving a member with time optimal motion between a current position and a target posi-

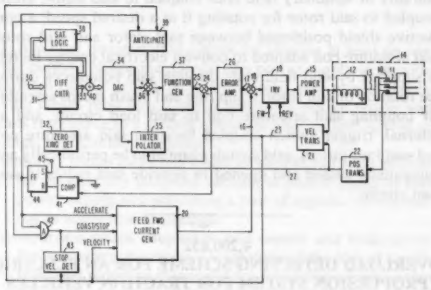
tion in response to a single input command which defines the distance between said positions, comprising in combination:

(a) an electromagnetic actuator coupled to said member and having a load acceleration characteristic which is proportional to the input current supplied thereto for accelerating and decelerating said member with said time optimal motion in response to an electric drive signal applied to the input circuit of said actuator;

(b) means including a power source and a first summing junction connected to said actuator for providing to said actuator said drive signal to cause said member to tend to follow a predetermined acceleration and deceleration profile for said distance to be moved specified by said single input command;

(c) a first generator for supplying to said first summing junction a first time varying signal corresponding to the profile of the actuator current required to move said member the distance specified by said input command with time optimal motion in an ideal system;

(d) an error amplifier connected to supply an error signal to said first summing junction concurrently with said first



time varying signal and having means for limiting the value of its output to no more than 15% of the value of said current drive signal;

(e) a second order position control system in which position is the controlled variable and acceleration is the manipulated variable for providing to said error amplifier an error signal representing the difference in the instantaneous position of said member in said actual system and said ideal system, said error signal varying the instantaneous acceleration and deceleration of said member in a direction tending to reduce said instantaneous position error, and further including a position transducer connected thereto for providing a signal to said second order position control system corresponding to the instantaneous actual position of said member during said time optimal motion; and

(f) means for controlling the operation of said first generator in response to the operation of said second order position control system to cause the respective signals generated thereby to be supplied concurrently to said first summing junction to achieve time optimal movement of said member.

4,200,828

PIVOTED ARM CONTROL ARRANGEMENT

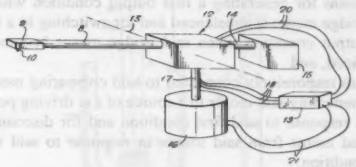
Keith D. Ridler, Cambridge, and Dexter R. Plummer, Ongar, both of England, assignors to Streathern Audio Limited, Belfast, Northern Ireland

Continuation of Ser. No. 626,564, Oct. 28, 1975. This application Feb. 2, 1978, Ser. No. 874,484

Claims priority, application United Kingdom, Oct. 30, 1974, 47030/74

Int. Cl.[2] G11B 3/10

U.S. Cl. 318—558 **5 Claims**



1. Apparatus for use in controlling the movement of an arm which is pivoted for movement in first and second orthogonal planes including means to generate a first electrical signal related to a movement of the arm in one direction in the first plane, a first motor arranged to move the arm in a direction opposite to the one direction, control means, an input of the control means being coupled to the said first signal and an output of the control means being coupled to the first motor and arranged to cause a force tending to counter movement of the arm in the one direction to be applied to the arm in accordance with the first signal, the first motor comprising a magnet attached to the arm for movement about orthogonal axes, the pivot axis of the arm and the magnet for movement thereof in the first plane being coincident and passing through the motor, and the pivot axis of the arm and of the motor for movement thereof in the second plane being coincident and passing through the motor and the first-mentioned axis at right angles thereto, stabilizing magnet pole pieces arranged one on each side of the magnet with their fields arranged to oppose the movement of the said magnet in the first direction and in a direction opposite to the first direction and a coil to which the output from the control means is coupled arranged to modify the said opposing fields according to a signal applied thereto.

4,200,829

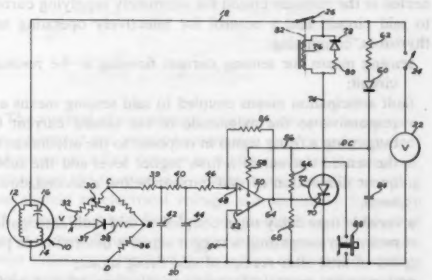
CIRCUIT FOR PROTECTING INDUCTION MOTORS

Walter J. Pohl, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 12, 1978, Ser. No. 924,104

Int. Cl.[2] H02P 1/44

U.S. Cl. 318—782 **6 Claims**



1. A protection circuit for a single phase induction motor of the type comprising a start winding and a capacitor connected in series, said circuit comprising

resistance bridge means, said start winding being connected in said bridge means to form one leg thereof, said bridge means being unbalanced for generating a d.c. output signal when the resistance of said start winding is less than a predetermined value, said bridge means being balanced for nullifying said output signal when said start winding resistance is equal to said value,

filtering means responsively connected to said bridge means for providing an essentially ripple-free d.c. output signal when said bridge means is unbalanced,

comparing means responsively connected to said filtering means for generating a first output condition when said bridge means is unbalanced and for switching to a second output condition when said bridge means becomes balanced, and

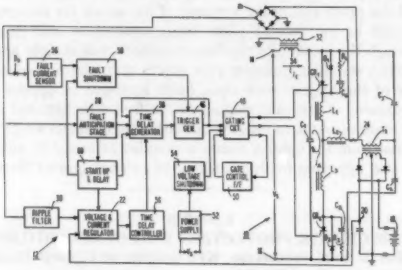
means responsively connected to said comparing means for connecting said motor to a source of a.c. driving potential in response to said first condition and for disconnecting said motor from said source in response to said second condition.

4,200,830

SERIES RESONANT BATTERY CHARGER AND CONTROL THEREFOR

George W. Oughton, Horsham, and Glenn J. Smollinger, Cornwells Heights, both of Pa., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Aug. 10, 1977, Ser. No. 823,249
Int. Cl.[2] H02J *7/10*; H02M *3/315*
U.S. Cl. 320—32 **21 Claims**



1. A battery charging circuit of the series resonant type including a resonant circuit adapted to be coupled to a battery for charging the battery and first and second thyristors connected in the resonant circuit for alternately supplying current to said circuit, and a control for selectively operating said thyristors, comprising:

sensing means for sensing current flowing in the resonant circuit;

fault anticipation means coupled to said sensing means and responsive to the magnitude of the sensed current for outputting a firing signal in response to the attainment by the sensed current of a first, higher level and the subsequent diminution of said current below a second, lower level;

a variable time delay stage coupled to said fault anticipation means for outputting a trigger signal a determinable period of time after receipt of said firing signal;

gating means operated by said variable time delay stage for alternately enabling said first and second thyristors; and

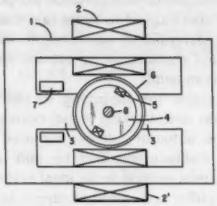
controller means coupled to said variable time delay stage for varying the point at which said trigger signal occurs.

4,200,831

COMPENSATED PULSED ALTERNATOR

William F. Weldon; Mircea D. Driga, and Herbert H. Woodson, all of Austin, Tex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 3, 1978, Ser. No. 930,616
Int. Cl.[2] H02K *39/00*
U.S. Cl. 322—8 **12 Claims**



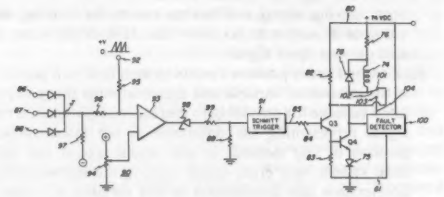
1. A pulsed alternator for sequentially supplying short duration, high power pulses of electrical power to a load circuit, said alternator comprising a rotor; an armature coil mounted on the outer periphery of said rotor; a stator provided with polepieces, said polepieces positioned adjacent to said rotor; a plurality of stationary field coils coupled to said stator; means coupled to said rotor for rotating it at a desired speed; a conductive shield positioned between said stator and said rotor, said armature coil adapted to convert electrical energy therein as supplied by said field coils through said polepieces during the rotation of said rotor; a slip ring and brush means assembly for coupling said armature coil to said load circuit; and an external, trigger switch coupled between said armature coil and said load circuit, said switch adapted to be periodically and sequentially closed and opened to provide said pulses to said load circuit.

4,200,832

OVERLOAD DETECTING SCHEME FOR AN ELECTRIC PROPULSION SYSTEM FOR TRACTION VEHICLES

August V. Johansson, and Joseph D. Schneider, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Apr. 10, 1975, Ser. No. 566,888
Int. Cl.[2] B60L *11/02*; H02H *7/08*
U.S. Cl. 322—59 **9 Claims**



1. In a traction vehicle propulsion system, the improvement comprising rotating dynamoelectric generating means having excitation means comprising a field winding, means connecting said field winding for energization to a source of relatively constant power, switching means connected in series with said field winding, means for normally switching said switching means cyclically between conductive and non-conductive states and for varying between predetermined relatively large and small extremes the per cycle proportion of time that said switching means is conducting so as to vary the level of field excitation as desired between predetermined normal maximum

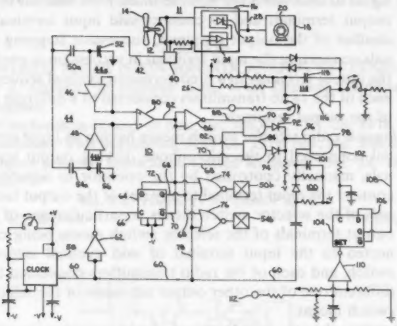
and minimum limits, respectively, said large extreme being less than all of a cycle, and monitoring means connected across said switching means and operative whenever said switching means is continuously conductive for producing an output signal indicative of an overexcitation condition.

4,200,833

POWER MAXIMIZATION CIRCUIT

Alan W. Wilkerson, 410 Madero Dr., Thiensville, Wis. 53092

Filed Oct. 31, 1977, Ser. No. 846,912
Int. Cl.[2] G05F *1/66, 5/00*
U.S. Cl. 323—20 **3 Claims**



1. A power maximization circuit for altering at least on one of the output voltage and current of a power supply to provide maximum output power from the supply, said power supply having means providing a signal indicating output power and means responsive to a control signal for altering the current or voltage, said circuit comprising:

sampling means including a pair of sample and hold circuits for periodically sampling the output power signal of said power supply and providing a pair of signals corresponding to successive samplings;

comparison means coupled to said sample and hold circuit for comparing the relative magnitude of the pair of signals from said sampling means and for providing a logic output signal, the logic condition of which is indicative of said relative magnitudes and of increases nd decreases in output power of the supply;

timing means coupled to said sampling means and providing an output signal of predetermined timing,

logic condition detection means including coincident signal gating means coupled to said comparison means and to said timing means for detecting the logic condition of the comparison means output signal by the coincidence of that signal and the output signal of said timing means; and

means coupled to said logic condition detection means for establishing the power supply control signal in a direction obtaining maximum power output responsive to changes in the logic condition of the comparison means output signal.

4,200,834

COMBINATION PROCESS SENSOR

William W. Carter, Livonia Center, N.Y., assignor to Sybron Corporation, Rochester, N.Y.

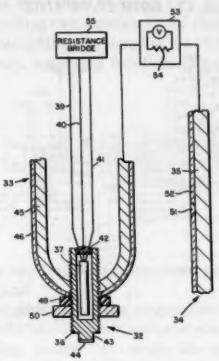
Filed Jul. 12, 1978, Ser. No. 923,813
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—450 **5 Claims**

1. A sensor for a steel vessel having an electrically non-conducting liner, for measuring temperature of a product contained in the vessel and monitoring for faults occurring in the non-conductive lining of the vessel, said sensor adapted to be supported in the vessel by a conductive structure electrically insulated from the vessel, said sensor comprising:

a tantalum body having a cavity extending within to a first end of the body;

temperature sensitive means contained in the cavity and electrically insulated from the body;

electrical leads extending from said temperature sensitive means from said cavity; and



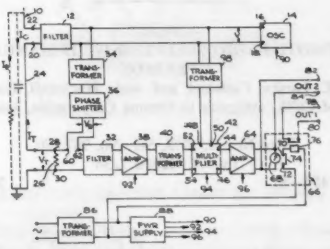
said body having a second end for contacting the product during use, said second end being at least partially covered with platinum, wherein electrical access is provided to the second end through said conductive structure.

4,200,835

METHOD AND APPARATUS FOR MEASURING THE INSULATION RESISTANCE OF AN OPERATING GROUNDED TRANSMISSION LINE SYSTEM

Ryoji Anahara; Koichi Sato; Motoshiro Kaneda, and Mitsuo Saito, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Filed May 30, 1978, Ser. No. 910,960
Int. Cl.[2] G01R *31/02, 27/18*
U.S. Cl. 324—51 **10 Claims**



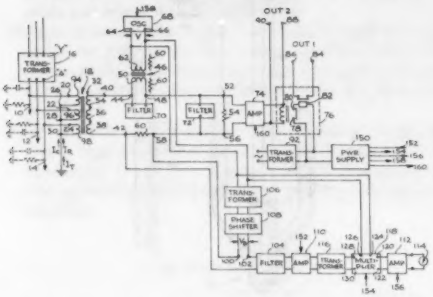
1. The method of measuring insulation resistance in an operating, grounded a.c. power transmission system carrying electrical power at a first frequency which includes the steps of: injecting into the transmission system in series with grounding means therein an electrical voltage at a secondary frequency much lower than said first frequency; detecting the level of resistive current flowing in said grounding means in said transmission system as a result of the injection of electrical voltage at said secondary frequency; and multiplying a voltage representative of said injected voltage by a voltage representative of said detected resistive current to give a product voltage representative of said insulation resistance.

4,200,836

APPARATUS FOR MEASURING INSULATION RESISTANCE IN AN OPERATING THREE-PHASE UNGROUNDED TRANSMISSION LINE SYSTEM

Isamu Okada, and Takehito Inoue, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Tokyo, Japan

Filed Jun. 13, 1978, Ser. No. 915,240
Int. Cl.[2] G01R *27/16, 31/02*
U.S. Cl. 324—51 8 Claims



1. In an ungrounded, three-phase a.c. transmission line system operating at a first frequency and having a grounding transformer with its "Y"-connected primary connected to respective lines representing the separate phases of said three-phase system, its neutral connection grounded and with an open-delta secondary, the method of measuring the insulation resistance of the lines of said transmission line system which includes the steps of:

applying across said open delta secondary an a.c. measuring voltage at a second frequency substantially below said first frequency;

producing a voltage representative of the current at said second frequency flowing in phase with said a.c. measuring voltage in said open delta secondary as a result of the application of said a.c. measuring voltage to said secondary; and,

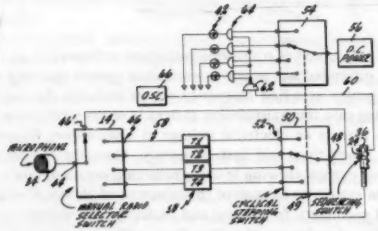
multiplying a voltage representative of said a.c. measuring voltage by said voltage representative of said current at said second frequency in phase with said a.c. measuring voltage to give a product voltage representative of said insulation resistance.

4,200,837

REMOTE RADIO SELECTOR WITH MANUAL OVERRIDE

Morrie E. Larsen, Carlsbad, and Alain Hackstaff, Escondido, both of Calif., assignors to Summa Corporation, Las Vegas, Nev.

Filed Nov. 3, 1978, Ser. No. 957,650
Int. Cl.[2] H04B *1/38*
U.S. Cl. 455—92 3 Claims



1. Apparatus for use in an aircraft having a control stick, to permit an operator to select one of several radio transmitters to transmit on without having to remove his hand from the control stick, a microphone being provided for use by the operator, said apparatus comprising:

a sequencing switch mounted on the control stick at a position accessible to the operator's hand, manually actuated by the operator to produce a stepping signal;

a cyclical stepping swith having an input terminal and having output terminals, and having means for selectively connecting said input terminal to one of the output terminals, having a stepping terminal connected to said sequencing switch, for being responsive to said stepping signal to disconnect the input terminal from said one of the output terminals and to connect said input terminal to another of the output terminals, successive stepping signals connecting the input terminal in succession to each of the output terminals in a predetermined cyclical sequence, each of the radio transmitters connected to a different one of the output terminals;

a manual radio selector switch means having an input terminal connected to the microphone, having output terminals, manually controlled by the operator to selectively connect the input terminal to any one of the output terminals of the selector switch means, a particular one of the output terminals of the selector switch means being connected to the input terminal of said cyclical stepping switch, and each of the radio transmitters connected to a different one of the other output terminals of the selector switch means;

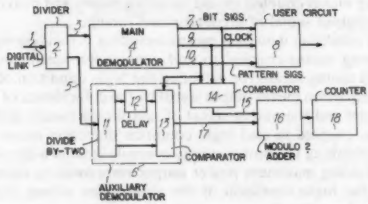
whereby when the input terminal of said manual radio selector switch means is connected to that particular one of the output terminals which is connected to the input terminal of said cyclical stepping switch, the operator can select a transmitter by actuating said sequencing switch, without having to remove his hand from the control stick.

4,200,838

APPARATUS FOR EVALUATING THE ERROR RATE OF BINARY DIGITAL SIGNALS

Jean-Pierre R. Poitevin, 53, rue Denis-Gogue, 92140 Clamart, France

Filed Apr. 28, 1978, Ser. No. 900,978
Claims priority, application France, May 6, 1977, 77 14475
Int. Cl.[2] H04J *3/14*
U.S. Cl. 371—22 2 Claims



1. Apparatus for the evaluation of an error rate of bits transmitted over a digital link according to a multiple level modulation process, said apparatus including a main and regulated demodulator having an input and an auxiliary demodulator for detecting disturbances and having an input, the respective inputs of the main and auxiliary demodulators being connected in parallel to the receiving end of the digital link, said main demodulator normally providing an output signal responsive to signals received over said link, said auxiliary demodulator being operated to change said normal output responsive to error conditions, the apparatus further including first comparison circuit means for comparing m bits of each bit pattern with m bits of the preceding bit pattern and for giving a first binary signal if the two compared bit patterns from said output of the

main demodulator are identical to each other and for giving a second binary signal if the two compared bit patterns are not identical to each other, and second comparison circuit means incorporated in the auxiliary demodulator for comparing the state of modulation of the received signal with the state of modulation of the preceding signal and for giving a first binary signal in the event of agreement and for giving a second binary signal in the event that said states of modulation are different from each other, modulo 2 adder means, the outputs of the first and second comparison circuit means being respectively connected to the inputs of the modulo 2 adder, and counter means, the output of the modulo 2 adder means being connected to the counter means to register the output thereof.

4,200,839

WIRED TELEVISION BROADCASTING SYSTEMS

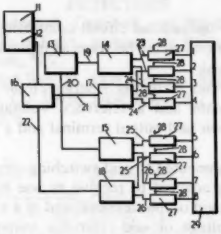
Eric J. Gargini, 72 Fairway Ave., West Drayton, Middlesex, England

Continuation-in-part of Ser. No. 736,410, Oct. 28, 1976, abandoned. This application May 26, 1978, Ser. No. 909,845

Claims priority, application United Kingdom, Oct. 29, 1975, 44500/75

Int. Cl.[2] **H04B** *3/50;* **H04N** *7/16*

U.S. Cl. 455—3 **4 Claims**



1. In a multiple channel wired television broadcasting system for making a plurality of programme signals with a preselected line frequency characteristic available on separate conductive paths to each of a plurality of programme selectors controllable by respective subscribers to the system, means arranging the conductive paths defining channels in two groups of channels, means providing a first one of said two groups of channels a first operating carrier frequency and the second of said two groups of channels a second carrier frequency offset by an odd integral multiple of half line frequency to the first, means establishing said carriers of each said group of channels in quadrature or in phase opposition to each other, and means allocating the channels to respective conductive paths arranged in pairs of adjacent conductive paths such that one conductive path of each pair operates at said first carrier frequency and the other conductive path operates at said second carrier frequency.

4,200,840

DUAL DETECTION SCHEME FOR COMPRESSIVE RECEIVERS

James B. Y. Tsui, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 6, 1978, Ser. No. 949,284

Int. Cl.[2] **H04B** *17/00*

U.S. Cl. 455—226 **4 Claims**

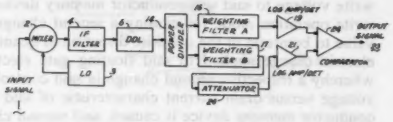
1. A radio receiver comprising:

a. means for converting a received radio frequency signal into an intermediate frequency signal the frequency of which varies linearly with time between lower and upper limits in a repeating cycle;

b. a bandpass filter having its input coupled to said converting means and having a pass band situated between said lower and upper frequency limits for deriving from said intermediate frequency signals a series of like intermediate frequency pulses of a duration determined by the width of the pass band and the rate of the frequency variation of the intermediate frequency signal;

c. means for compressing said intermediate frequency pulses to pulses of very short duration;

d. means providing two separate signal channels each having means for weighting the signal in the channel as a function of frequency, weighting functions in two channels being different;



e. means for applying said compressed pulses to said signal channels; and

f. means for comparing the magnitudes of the weighted signals in the two channels and producing an output signal representing binary "1" when the magnitude of the weighted signal in the first of the two channels exceeds the magnitude of the weighted signal in the second of the two channels, and an output signal representing binary "0" when the magnitude of the weighted signal in the first of the two channels is less than that in the second channel.

4,200,841

PRESET TUNING APPARATUS USING FLOATING GATE TYPE FIELD EFFECT DEVICE

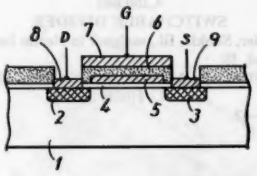
Yoshinosuke Nagata, Kobe; Hiroshi Kutsuyama, Kadoma; Makoto Yamada, Katano, and Kazuyoshi Tsukamoto, Neyagawa, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Oct. 11, 1978, Ser. No. 950,453

Claims priority, application Japan, Oct. 14, 1977, 52-124197

Int. Cl.[2] **H04B** *1/34*

U.S. Cl. 455—169 **22 Claims**



1. A preset tuning apparatus adapted for selecting a preset channel, comprising:

non-volatile analog storage means including a floating gate type field effect semiconductor memory device, said floating gate type field effect semiconductor memory device comprising a semiconductor substrate of one conductivity type having a main surface, source and drain regions of the opposite conductivity type spaced apart on said main surface of said semiconductor substrate, a first insulating layer formed on said main surface of said semiconductor substrate at least in an area between said source and drain regions, a floating gate electrode formed on said first insulating layer above said area on said main surface between said source and drain regions, a second insulating layer formed on said floating gate electrode, and a control gate electrode formed opposite to said floating gate electrode, on said second insulating layer, said floating gate

type field effect semiconductor memory device exhibiting a change in the control gate voltage versus drain current characteristic as a function of the type and quantity of electric charge applied to said floating gate electrode,

first voltage applying means for selectively applying an erase voltage to said semiconductor memory device in an erase operation mode for causing a first change to a predetermined value in one direction in quantity of electric charge applied to said floating gate electrode, whereby a respective first change in said control gate voltage versus drain current characteristic of said semiconductor memory device is caused,

second voltage applying means for selectively applying a write voltage to said semiconductor memory device in a write operation mode for causing a second change to a value to be preset in the opposite direction in quantity of electric charge applied to said floating gate electrode, whereby a respective second change in said control gate voltage versus drain current characteristic of said semiconductor memory device is caused, said second change being associated with the value being preset in quantity of electric charge and being in the direction opposite to said first change,

third voltage applying means for selectively applying a read voltage to said semiconductor memory device in a read operation mode for withdrawing an analog electrical signal representative of a drain current determinable as a function of said value being preset in quantity of electric charge in said floating gate electrode in terms of said control gate voltage versus drain current characteristic of said semiconductor memory device,

first tuning voltage providing means operatively coupled to said third voltage applying means for providing a first tuning voltage associated with said analog electrical signal representative of a drain current determinable as a function of said value being preset in quantity of electric charge in said floating gate electrode in terms of said control gate voltage versus drain current characteristic of said semiconductor memory device, and

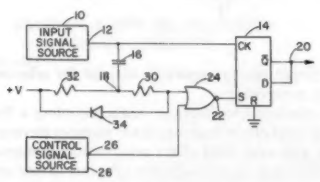
tuning means comprising voltage controlled variable reactance means connected to receive said first tuning voltage from said first tuning voltage providing means, said value to be preset being preselected for enabling selection by said tuning means of said preset channel.

4,200,842

SWITCHABLE DIVIDER

Dan E. Monnier, Skokie, Ill., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Apr. 13, 1978, Ser. No. 895,743
Int. Cl.[2] H03K *21/36*
U.S. Cl. 328—42 **8 Claims**



1. A frequency divider circuit comprising:

means for generating a succession of clock pulses having a frequency f and characterized by logical transitions having first and second polarities;

control means selectively operable for producing a control signal having first and second logical levels;

bi-stable means characterized by first and second logical states and responsive to said first polarity logical transitions of said clock pulses for changing logical states; and

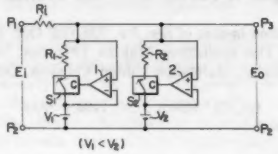
logic means responsive to one of said logical levels of said control signal and to said clock pulses for causing said bi-stable means to assume a predetermined one of said logical states in response to said second polarity logical transitions.

4,200,843

NON-LINEAR OPERATIONAL CIRCUIT

Tsuneyuki Egami, Okazaki; Hisasi Kawai, Toyohashi; Tokio Kohama, Nishio, and Hideki Obayashi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 28, 1977, Ser. No. 865,114
Claims priority, application Japan, Feb. 25, 1977, 52/20506
Int. Cl.[2] H03K *17/00*
U.S. Cl. 328—142 **4 Claims**



1. A non-linear operational circuit comprising:

an input resistor connected between an input terminal and an output terminal;

a switching circuit including a series circuit of a resistor, switching means and a reference voltage source connected between said output terminal and a ground terminal; and

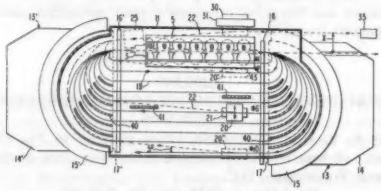
a comparator connected to said switching circuit, said comparator being adapted to receive as one input a voltage generated at said output terminal and as a reference input an output voltage of said reference voltage source for comparing the same with each other and opening or closing said switching means in accordance with the result of said comparison.

4,200,844

RACETRACK MICROTRON BEAM EXTRACTION SYSTEM

Craig S. Nunan, Los Altos Hills, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 750,106, Dec. 13, 1976, abandoned. This application Oct. 5, 1978, Ser. No. 948,842
Int. Cl.[2] H05H *7/10, 13/00*
U.S. Cl. 328—230 **16 Claims**



1. A racetrack microtron comprising:

linear accelerator means for producing an energetic beam of charged particles,

beam re-circulation means for again introducing said accelerated charged particle beam to said linear accelerator means for further acceleration,

said recirculation means defining a plurality of orbital paths for consecutive traversal by said charged particle beam,

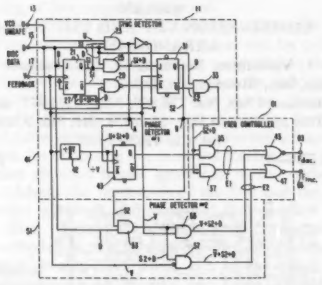
all said orbital paths having a common linear portion along a common axis, and each said orbital path comprising curved portions and displaced therefrom, each said orbital path being distinguished by the energy of the beam traversing said orbital path, the radii of curvature of curved portions being greater for a greater beam energy whereby said antiparallel portions of said successive orbital paths are displaced at successively greater distances from said common axis; and means for extracting said beam from a selected orbital path comprising first means for diverting said beam from said selected orbital path through a first angle generally toward said common axis and second means for diverting said beam generally toward said common axis, said second means disposed on the opposite side of said axis from said first means and said second means disposed to cause said beam to execute said second diversion through a second angle generally toward said common axis, the magnitude of said first angle equal to the magnitude of said second angle, and envelope means for enclosure of said orbital paths, said envelope means adapted for evacuation.

4,200,845

PHASE COMPARATOR WITH DUAL PHASE DETECTORS

Charles E. Mendenhall, Campbell, and Randall L. Sandusky, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,571
Int. Cl.[2] H03B *3/04*; H03K *1/17, 5/20*
U.S. Cl. 331—1 A **8 Claims**



1. In a digital phase locked loop of the type having a voltage controlled oscillator (VCO) receiving input data and error signals from a phase comparator, and producing a VCO masking signal for noise reduction, as well as a VCO feedback signal, a phase comparator comprising,

a first phase detector means for producing first order approximation error signals for increasing or decreasing the frequency of a VCO upon comparison of a VCO feedback and a data signal,

a second phase detector means for producing second order approximation error signals for increasing or decreasing the frequency of a VCO upon comparison of a VCO feedback and a data signal, and

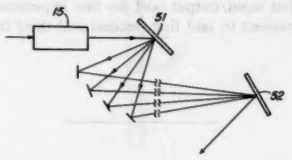
logic means operatively associated with said first and second phase detector means and connected to receive a VCO masking signal indicating a VCO safe or unsafe condition, said logic means for activating said first phase detector means for a VCO unsafe condition and for activating said second phase detector means for a VCO safe condition, said first and second phase detector means activated upon timewise overlap between data and VCO feedback signals.

4,200,846

EFFICIENT LASER AMPLIFIER USING SEQUENTIAL PULSES OF DIFFERENT WAVELENGTHS

Eugene E. Stark, Jr.; John F. Kephart; Wallace T. Leland, and Walter H. Reichelt, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1977, Ser. No. 838,011
Int. Cl.[2] H01S *3/06, 3/101*
U.S. Cl. 331—94.5 R **1 Claim**



1. A laser power amplifying device comprising:

a laser oscillator generating a pulse train having a plurality of discrete frequencies;

laser power amplifier means for amplifying said pulse train;

frequency splitting means for separating each of said discrete frequencies into an individual beam;

delay means in each of said beams; and,

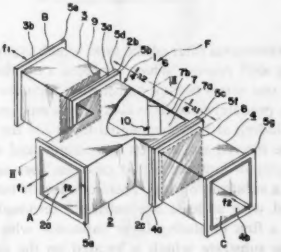
combining means for combining said delayed beams into a single pulse.

4,200,847

RECTANGULAR BRANCHING FILTER HAVING PLURALITY OF ROD MEMBERS FOR FINE IMPEDANCE MATCHING

Toshio Nishikawa, Nagaokakyo; Yoji Ito, Takatsuki; Youhei Ishikawa, and Sadahiro Tamura, both of Kyoto, all of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Sep. 26, 1977, Ser. No. 836,902
Claims priority, application Japan, Oct. 4, 1976, 51-133834
Int. Cl.[2] H01P *5/12*
U.S. Cl. 333—125 **1 Claim**



1. A T-shape rectangular waveguide branching filter comprising:

a main structure having first, second and third input/output ports, a first rectangular waveguide section connecting said second and third input/output ports in a straight line and a second rectangular waveguide section connected to said first input/output port and intersecting said first rectangular waveguide section at a right angle;

a protrusion of an electrically conducting material having a triangular cross section, said protrusion aligned perpendicular to the plane of the longitudinal axes of said first and second rectangular waveguide sections and disposed

within said main structure at a central portion of the wall of said first rectangular waveguide section opposite the intersection with said second rectangular waveguide section for confronting said first input/output port and for preliminary impedance matching of a predetermined accuracy with respect to said first, second and third input-/output ports; and

a plurality of rod members of electrically conductive material extending through said protrusion to project from the apex portion of said protrusion toward said first input/output port for selective movement toward and away from said first input/output port for fine impedance matching with respect to said first, second and third input/output ports.

4,200,848

TRANSVERSAL FILTER

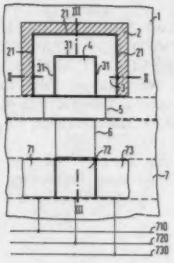
Karl Knauer, Starnberg, and Hans-Joerg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 18, 1978, Ser. No. 907,011

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1977, 2727339

Int. Cl.[2] **H03H** *7/28, 7/30;* **G11C** *19/14;* **H03K** *5/159*

U.S. Cl. 333—165 **7 Claims**



1. In a transversal filter of the type which comprises at least one analog shift register which includes a number of parallel inputs and one series output, and further includes a number of individual, predeterminable evaluator circuits, each evaluator circuit including at least one signal input for the input of the signal to be filtered and at least one output, and wherein each evaluator circuit includes a pair of capacitors arranged on a surface of a substrate of doped semiconductor material which is provided with at least one substrate terminal, and which comprises a first insulating layer capacitor which contacts a zone of the substrate which is located on the surface of the substrate which has a terminal contact, and which is doped oppositely to the substrate, and comprising a second insulating layer capacitor which is arranged closely beside the first capacitor, and wherein the second insulating layer capacitor is connectible via a switching element to an associated parallel input, the improvement wherein:

at least one evaluator circuit includes a doped zone having a first recess with the first insulating layer blocking layer-capacitor disposed in the first recess; and

said first capacitor includes a second recess with the second insulating layer capacitor disposed therein so that the latter is surrounded by the doped zone and by the first insulating layer capacitor.

4,200,849

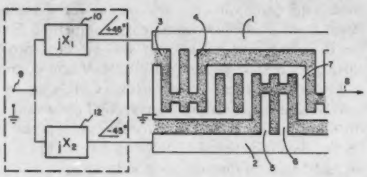
TUNED UNIDIRECTIONAL SURFACE WAVE TRANSDUCER

Donald C. Malocha, Plano, Tex., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Jun. 30, 1978, Ser. No. 920,798

Int. Cl.[2] **H03H** *9/04, 9/20, 9/26;* **H01L** *41/10*

U.S. Cl. 333—194 **7 Claims**



1. A SAW device for filtering input signals received from a source including a unidirectional input transducer with first and second terminals, the application of quadrature related signals of equal power to said terminals resulting in the generation of a unidirectionally propagating wave form in said SAW device, the impedance looking into each terminal being A cos $\phi - jA \sin \phi$, the improvement comprising:

substantially nonresistive reactance means coupling said source of input signals to said terminals, said reactance means combined with said first terminal impedance providing a first terminal effective input impedance of $A\angle 45°$, and combined with said second terminal impedance providing a second terminal effective input impedance of $A\angle -45°$.

4,200,850

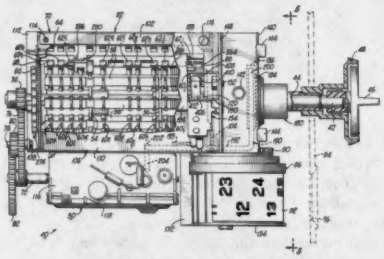
COMBINATION VHF AND UHF TUNER ARRANGEMENT

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Continuation of Ser. No. 776,890, Mar. 11, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,343

Int. Cl.[2] **H03J** *5/30*

U.S. Cl. 334—1 **109 Claims**



1. A television tuner arrangement for receiving signals in both the VHF and UHF television bands, comprising a combined VHF and UHF station selector shaft, detent means for establishing twenty-four equally spaced positions for said selector shaft, VHF tuner means operative in alternate ones of said positions to receive signals from different VHF television stations, UHF tuner means having a main tuning shaft rotation of which is effective in less than one revolution to receive signals from all of the television stations within the UHF band, means operative in the positions between said alternate positions for enabling said UHF tuner means, and means interconnecting said station selector shaft and said main tuning shaft so that rotation of said station selector shaft a plurality of revolutions causes said UHF tuner means to receive signals from all of the television stations within the UHF band, said VHF tuner

means being operative repeatedly to receive the same VHF stations in said alternate positions during successive rotations of said station selector shaft.

4,200,851

DEFLECTION UNIT FOR AN IN-LINE COLOR CATHODE-RAY TUBE

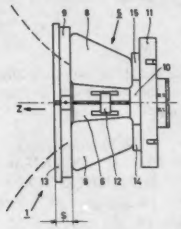
Joris A. M. Nieuwendijk, and Nicolaas G. Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 15, 1978, Ser. No. 933,829

Claims priority, application Netherlands, Aug. 26, 1977, 7709431

Int. Cl.[2] **H01F** *7/00*

U.S. Cl. 335—210 **8 Claims**



1. A deflection unit, for use in a color cathode-ray tube of the in-line type having on the display screen a structure of uninterrupted phosphor lines, comprising:

a yoke ring of ferromagnetic material;

a saddle-shaped first deflection winding surrounded by the yoke ring and having a front and a rear end for deflecting in a first direction electron beams generated in the cathode-ray tube, the electron beams, when the deflection unit is provided on a cathode-ray tube, passing through the winding in the direction from the rear to the front end,

a second deflection winding, likewise having a front and a rear end, for deflecting in a direction transverse to the first direction electron beams generated in the cathode-ray tube, wherein the front ends of the first and the second deflection windings are positioned at a distance S from each other, whereby the deflection unit, when provided on a cathode-ray tube, is self-converging for a first screen format and, with a variation Δ S of the distance S, is self-converging for a second screen format by moving the second winding with respect to the first winding, in which it holds that: $S=\alpha\Delta Z_s$ where:

Z_s is the variation in distance between the front end of the first winding and the screen, and $0.05<\alpha<0.3$.

4,200,852

MAGNETIC LOCKING APPARATUS

Yoshihiro Aoki, Tokyo, Japan, assignor to Application Art Laboratories Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,106

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1977, 2730115

Int. Cl.[2] **H01F** *7/00*

U.S. Cl. 335—285 **8 Claims**

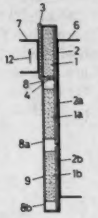
1. A magnetic locking apparatus comprising:

at least one permanent magnet having first and second opposite side surfaces and an end surface extending between said first and second side surfaces;

a first ferromagnetic member on said first side surface of said permanent magnet, said first ferromagnetic member having an end portion extending outwardly beyond said end surface of said permanent magnet;

nonferromagnetic material enclosing said permanent magnet and covering said second side surface of said permanent magnet, said nonferromagnetic material being spaced from said end surface of said permanent magnet to define therebetween a chamber, said nonferromagnetic material having an aperture therethrough into said chamber; and

a second ferromagnetic member removably mounted on that portion of said nonferromagnetic material covering said



second side surface of said permanent magnet, said second ferromagnetic member having a hook portion extending through said aperture and said chamber into contact with said end portion of said first ferromagnetic member, said aperture and said chamber having a substantially greater thickness than said hook portion.

4,200,853

TRANSFORMER WITH SINGLE TURN U-SHAPED WINDING

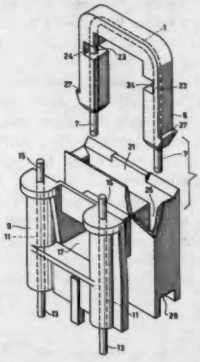
Nicolaas J. de Jong, and Adrianus C. W. Custers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,971

Claims priority, application Netherlands, Jun. 6, 1977, 7706192

Int. Cl.[2] **H01F** *15/10, 27/30*

U.S. Cl. 336—192 **3 Claims**



1. A transformer comprising first and second windings, said first winding comprising a single turn in the form of a U-shaped elongate conductor embedded in a first body of synthetic material and having two ends of the conductor projecting outside said first body of synthetic material to serve as connection pins for said first winding, the second winding being electrically connected to connection pins comprising an elongate conductor embedded in a second body of synthetic material and having end portions of the elongate conductor projecting outside the second body of synthetic material to serve as said connection pins, and the first body of synthetic material being accommodated in a space recessed in the second body of synthetic material which supports at least the second

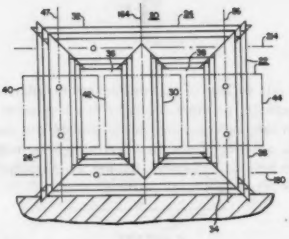
winding of the transformer and also the connection pins of said second winding.

4,200,854

CORE WITH STEP-LAP JOINTS

Angelo A. DeLaurentis, Sharpsville; Frank G. Zola, Jr., and Theodore R. Specht, both of Sharon, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 4, 1979, Ser. No. 933
Int. Cl.[2] H01F *27/24*
U.S. Cl. 336—217 **16 Claims**



1. A magnetic core for electrical inductive apparatus, comprising:

a plurality of superposed layers of metallic, magnetic laminations stacked to a predetermined build dimension to define at least first and second leg members and lower and upper yoke members,

each of said layers including at least first and second leg laminations having first and second diagonally cut ends, and lower and upper yoke laminations having diagonally cut ends, with the first and second diagonally cut ends of the first and second leg laminations butting the diagonally cut ends of the lower and upper yoke laminations respectively, to define miter joints,

said leg laminations in each of said first and second leg members being arranged in a plurality of first groups in a first one-half of the build dimension, and in a plurality of second groups in the remaining one-half,

said leg laminations in each of the first groups having like mean length dimensions,

at least certain of the leg laminations in each of the second groups having unlike mean length dimensions,

said leg laminations in each of the first and second groups being arranged to offset the joints between at least certain of the layers in each group, in predetermined step-lap patterns.

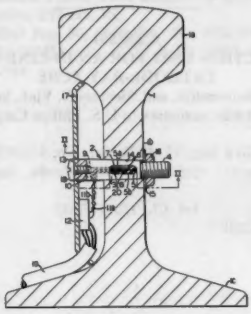
4,200,855

BOLT-LIKE RAILWAY VEHICLE WHEEL DETECTOR

Heinz Gilcher, Export, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jun. 1, 1978, Ser. No. 911,618
Int. Cl.[2] G01L *1/22*
U.S. Cl. 338—5 **10 Claims**

1. A detecting device for sensing passing wheels of railway vehicles comprising, a bolt-like member having a cavity formed therein, a strain gage member located within said cavity, a track rail for supporting the passing wheels of the railway vehicles, said bolt-like member is tapered and is threaded at one end to be fitted into an aperture formed in said track rail and is secured to said track rail by a nut whereby said strain



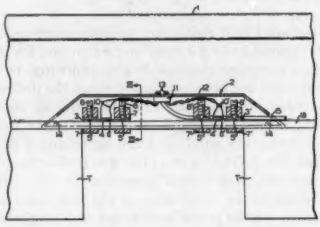
gage member detects the stress which is imparted to the track rail under the load of the wheels of the railway vehicles.

4,200,856

DIFFERENTIAL CLAMP-ON RAILWAY VEHICLE WHEEL DETECTOR

Heinz Gilcher, Export, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jun. 1, 1978, Ser. No. 911,630
Int. Cl.[2] H01L *1/22*
U.S. Cl. 338—5 **10 Claims**



1. A differential detecting device for sensing a passing object moving along a trackway comprising, a pair of sensing units each positioned at a given spaced location along the trackway, said sensing units each including a base support member and a strain gage element, each of said strain gage elements bonded to a respective one of said base support members, and clamping means for firmly holding said sensing units to the base flange of the trackway for allowing said strain gage elements to detect the stress which is imparted to the trackway under the load of the passing objects.

4,200,857

VARIABLE RESISTOR

Mikio Sato, Furukawa, and Kozo Magami, Tohda, both of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1978, Ser. No. 874,019
Claims priority, application Japan, Feb. 1, 1977, 52-10747[U]
Int. Cl.[2] H01C *10/34*
U.S. Cl. 338—174 **3 Claims**

1. A variable resistor comprising

an electrically insulating substrate plate;

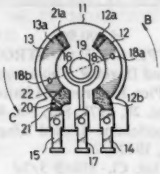
a pair of opposing resistance bodies provided on said plate;

means including a slide adapted to contact said resistance bodies for varying the resistance value between output terminals connected to respective ones of said resistance bodies;

a lead conductor provided beneath one of said resistance bodies;

an insulating layer provided between said lead conductor and said one resistance body,

said lead conductor being connected to one end portion of said one resistance body and extending to the other end



portion of said one resistance body, whereby, said terminals can be located at the same side of said plate; and further including

conductive portions connected to respective end portions of said resistance bodies, the conductive portion connected to said one end portion of said one resistance body being constituted by an extended end of said lead conductor.

4,200,858

ACOUSTIC WAVE SCANNING APPARATUS

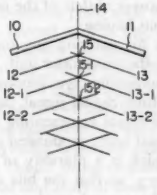
Matsuo Takashima, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Ja

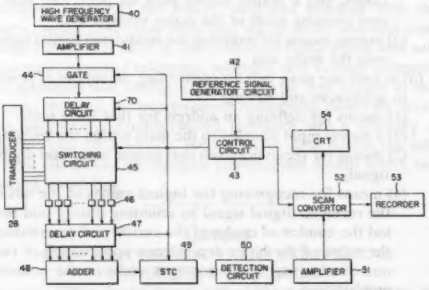
Continuation of Ser. No. 7[illegible]78, Jan. 12, 1977, abandoned. This application Jun. [illegible], 1978, Ser. No. 913,039

Claims priority, application Japan, Dec. 28, 1976, 51-158521

Int. Cl.[2] G01S *9/66*; G01N *29/00*

U.S. Cl. 367—135 **18 Claims**





1. An apparatus for scanning acoustic waves in accordance with movement of a presumed axis moved on a certain surface, said apparatus comprising an acoustic transducer element row comprising a plurality of acoustic transducer elements; a pulse signal generating circuit for imparting energy to individual ones of said acoustic transducer elements; and operation controller means for controlling the operations of individual ones of said acoustic transducer elements; said operation controller having the function of causing individual ones of said acoustic transducer elements to operate as a plurality of sets, each including a plurality of acoustic transducer elements, in accordance with the position to which said presumed axis is moved each time said pulse signal is obtained and the function of imparting an operation time difference to the acoustic transducer elements in each of said sets so that the envelope surface of wave fronts formed by the individual acoustic elements forming at least one of said sets and the envelope surface of wave fronts formed by the individual acoustic elements forming at least one of the other sets overlap each other on said presumed axis and the point of overlap between said wave fronts is moved along said presumed axis, and that the center of curvature of the envelope surface formed by each of said sets lies outside said presumed axis.

4,200,859

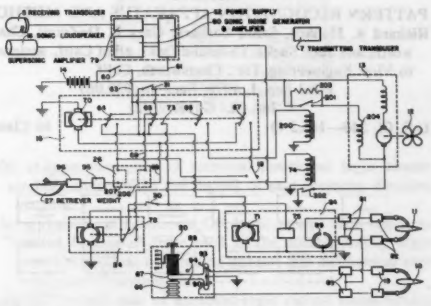
DEVICE FOR SIMULATING MARINE CRAFT NOISES

David J. Evans, and Clark F. Bradley, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1946, Ser. No. 656,104

Int. Cl.[2] H04K *3/00*

U.S. Cl. 367—1 **4 Claims**



2. In combination in a self-noise generator for a decoy-submarine, a gas-filled electronic tube for generating a wide-band noise signal, a modulator valve for modulating said signal, a first oscillator operating at a propeller-beat frequency for controlling said modulator, a second oscillator operating at a frequency corresponding to the tooth-impact frequency of a submarine's main drive gear, and amplifier means for amplifying the outputs of said modulator and said second oscillator.

4,200,860

METHOD AND APPARATUS FOR SIGNALLING MOTORISTS AND PEDESTRIANS WHEN THE DIRECTION OF TRAFFIC WILL CHANGE

George H. Fritzinger, 15 Standish Ave., West Orange, N.J. 07052

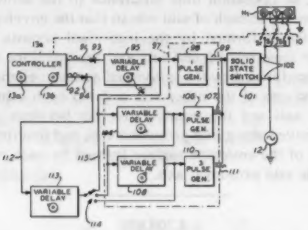
Continuation-in-part of Ser. No. 681,539, Apr. 29, 1976, abandoned. This application May 12, 1978, Ser. No. 905,350

Int. Cl.[2] G08G *1/096, 1/095*

U.S. Cl. 340—43 **16 Claims**

9. In an apparatus for controlling traffic intersection signal lights comprising red, green and yellow lights in each direction of traffic to inform motorists and pedestrians as to when the lights will change to red and to green to indicate a change in direction of traffic, wherein a predetermined blinking of a red or green light followed by a steady "on" condition is prescribed to signify that a predetermined time remains before the direction of traffic will change: the combination with a controller which shifts the lights to red and to green at respective preset time intervals, of an interrupter switch in the power line of the signal lights, timing means cyclically operable to actuate

said interrupter switch during each period the lights are red or green for blinking said lights on said said prescribed time basis to signal the time remaining before the direction of traffic will change, wherein the remaining "on" time is substantially



greater than the duration of the blinking and means connecting said timing means to said controller for starting each cycle of the timing means the instant the controller shifts said lights to red and to green.

4,200,861

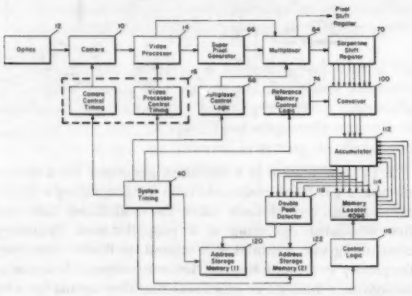
PATTERN RECOGNITION APPARATUS AND METHOD

Richard A. Hubach, Santa Barbara; Gary L. DeZotell, Chatsworth, and Jack Sacks, Thousand Oaks, all of Calif., assignors to View Engineering, Inc., Chatsworth, Calif.

Filed Sep. 1, 1978, Ser. No. 939,061

Int. Cl.[2] G06K 9/12

U.S. Cl. 340—146.3 Q **16 Claims**



1. A pattern recognition method for determining the best comparison between a reference area and a search area and in real time comprising the steps of:

generating a clocked digitized video signal having a pulse width termed a pixel,

generating a super pixel having a pulse width greater than a pixel by a given amount,

storing pixels representing a reference scene in an addressable memory location,

storing super pixels representing said same reference scene in a separate addressable memory,

convolving super pixels generated from a search area with super pixels from said memory and generating a count indicative of a comparison in each segment compared,

storing the count in each segment in a separate addressable memory,

determining the maximum count and identifying the coordinate of the address of the memory having the maximum count as a measure of the coarse location of the best match,

establishing a search pattern around said coarse coordinate including an odd number of pixels with the coordinate pixel in the center,

convolving pixels generated from said search pattern with pixels from said memory and generating a count indicative of a comparison in each segment of the search pattern,

storing the count in each pattern in a separate addressable memory, and

determining the maximum count in each of the segments of the search pattern and identifying the coordinate of the address as a measure of the fine location of the best match.

4,200,862

APPLIANCE CONTROL

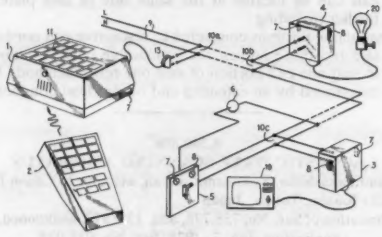
David C. Campbell, and David R. Thompson, both of Fife, Scotland, assignors to Pico Electronics Limited, Fife, Scotland

Filed Dec. 28, 1977, Ser. No. 865,350

Claims priority, application United Kingdom, Jan. 7, 1977, 638/77; May 9, 1977, 19428/77

Int. Cl.[2] H04B 3/54

U.S. Cl. 340—310 A **31 Claims**



1. An electrical appliance control system for controlling electrical appliances within a building and comprising:

(a) a power main of the building;

(b) a plurality of power outlets of the main;

(c) a transmitter unit having:

(1) input means for entering any one of a plurality of addresses into the transmitter unit;

(2) means for generating, synchronously with the mains voltage, a multibit digital signal, comprising a multibit digital address signal representing an entered address, the digital signal being modulated on a carrier the frequency of which is a plurality of times greater than mains frequency, so that the bits of the digital signal comprise predetermined numbers of cycles of the carrier, the predetermined numbers depending upon the bit values, and a period within each bit occurring near a zero crossing point of the mains voltage; and

(3) output means for coupling the modulated digital signal onto the main; and

(d) at least one slave unit for controlling the supply of power to appliances and having:

(1) means for defining an address for that slave unit;

(2) a power input coupled to the main within the building;

(3) means for receiving from said power input said digital signal;

(4) means for recognizing the logical values of the bits of the received digital signal by counting during said period the number of cycles of the carrier and determining the value of the bit in dependence upon which of two non-overlapping number ranges contains the counted number; and

(5) means for comparing the digital address signal received by the receiving means with the address of the defining means and for rendering the slave unit operable to effect an appliance power supply control operation when correspondence is found between said address and the digital address signal;

(e) at least one of the transmitter and slave unit being releasably coupled to a power outlet of the main so as to be usable optionally at various placed within the building.

4,200,863

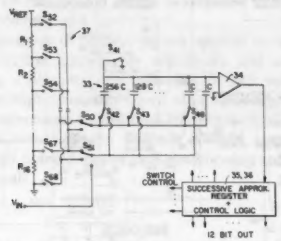
WEIGHTED CAPACITOR ANALOG/DIGITAL CONVERTING APPARATUS AND METHOD

David A. Hodges, Berkeley; Paul R. Gray, Orinda, and James L. McCreary, Santa Clara, all of Calif., assignors to The Regents of the University of California, Calif.

Continuation-in-part of Ser. No. 838,908, Oct. 3, 1977, Pat. No. 4,129,863. This application Dec. 11, 1978, Ser. No. 968,590

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 AD 5 Claims



1. In an analog/digital converter for converting between an analog and a digital signal, said converter comprising an array of binary weighted capacitors having capacitance values corresponding to a predetermined number of binary bits ranging from a most to a least significant bit, a common plate node within said array, a voltage comparator having first and second input terminals and an output terminal, said common plate node being connected to said first input terminal, said second input terminal being connected to a first predetermined reference, a digital control circuit coupled to said output terminal, a first switch operated by said digital control circuit to selectively connect said common plate node to said first predetermined reference, a second switch operated by said digital control to alternately select the analog signal and a second predetermined reference, and a first plurality of additional switches operated by said digital control circuit, each of said first plurality of additional switches being configured to selectively connect ones of said array of binary weighted capacitors to said first predetermined reference and said second switch, said digital control circuit being responsive to a serial digit input sequence so that said array of binary weighted capacitors sequentially samples and holds the analog signal, divides said second predetermined reference signal into binary weighted portions, combines the binary weighted portions with the analog signal to provide combined signal levels, and said comparator compares each of said combined signal levels with said first predetermined reference, whereby said voltage comparator quantizes said analog signal as a serial digit output at said output terminal, the improvement comprising means for dividing said second predetermined reference into a plurality of incremental sub-intervals, and means for determining the individual one of said incremental sub-intervals within which said analog signal lies.

4,200,864

PROCESS CONTROL PLANT COMPRISING PROCESSING OF SIGNALS

Auguste Gillet; Paul Gilsoul, both of Mont-sur-Marchienne, and Emile Malhaize, Marcinelle, all of Belgium, assignors to Ateliers de Constructions Electriques de Charleroi (ACEC), Charleroi, Belgium

Filed Oct. 3, 1977, Ser. No. 838,960

Claims priority, application Belgium, Oct. 11, 1976, 847141

Int. Cl.[2] G21C *17/00*

U.S. Cl. 340—507 7 Claims

1. A process control installation for mechanical elements in which a determined number of physical characteristics are to be detected or measured, each by several independent probes, comprising:

(a) a plurality of comparator circuits including:

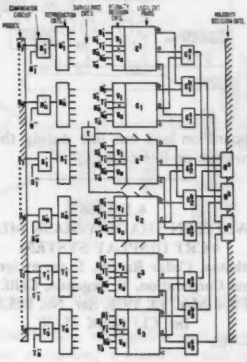
(1) means for receiving a signal from a sensor,

(2) means for receiving a reference signal, and

(3) means for outputting a signal representative of the difference of said sensor signal and said reference signal;

(b) a plurality of reproduction circuits connected to the output of a corresponding comparator circuit;

(c) a plurality of majority decision circuits, each one associated with one of the physical characteristics and each connected to one of the outputs of all said reproduction circuits;



(d) at least two pairs of identical functional logic circuit trains connected to the output of said majority decision circuits;

(e) a plurality of functional OR logic groups each one connected to outputs from each of the corresponding logic circuit trains and influencing at least one mechanical process control element; and

(f) each of said pair of identical logic circuit trains having corresponding outputs connected to functional AND logic circuits, the outputs of the functional AND logic circuits being connected to the inputs of said functional OR logic circuits.

4,200,865

PRINTED CIRCUIT BOARD CAPABLE OF BEING INSERTED AND WITHDRAWN ON ON-LINE STATUS

Takayuki Morioka, and Jushi Ide, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1978, Ser. No. 872,794

Claims priority, application Japan, Feb. 2, 1977, 52-9672

Int. Cl.[2] H05K *1/04*

U.S. Cl. 340—536 11 Claims

1. A printed circuit board loaded with an electronic circuit and constructed to be capable of being inserted in and withdrawn from a common input/output bus line on on-line status comprising:

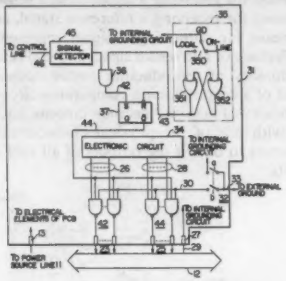
first means for electrically connecting said electronic circuit with said bus line;

second means for generating a first output signal in response to the demand for the insertion or withdrawal of said printed circuit board on on-line status;

third means for detecting whether or not said printed circuit board is making exchange of information through said bus line with other unit connected electrically with said bus line, thereby generating a second output signal indicative of the absence of the information exchange; and

fourth means for disabling said first means in response to the simultaneous presence of said first and second output signals to release the electrical connection between said

printed circuit board and said bus line thereby avoiding an electrical influence which may be exerted by said printed



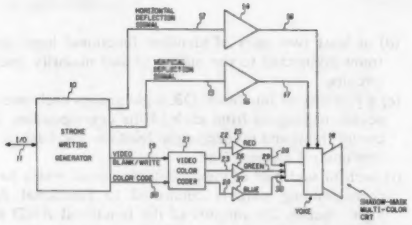
circuit board on said bus line during the insertion and withdrawal on on-line status.

4,200,866

STROKE WRITTEN SHADOW-MASK MULTI-COLOR CRT DISPLAY SYSTEM

Lyle R. Strathman, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 13, 1978, Ser. No. 885,843
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—703 **11 Claims**



1. In combination: a multi-color, shadow-mask cathode ray tube including means for generating plural electron beams; a plurality of video amplifier means each associated with an individual one of said plural means for generating; a stroke-writing deflection signal generating means, means for simultaneously controlling deflection of said plural electron beams in response to the output of said deflection signal generating means, and color code means operable in synchronism with said deflection signal generating means to effect selected turn-on permutations of said plurality of video amplifier means.

4,200,867

SYSTEM AND METHOD FOR PAINTING IMAGES BY SYNTHETIC COLOR SIGNAL GENERATION AND CONTROL

Elmer D. Hill, 6498 Surfside, Sacramento, Calif. 95831

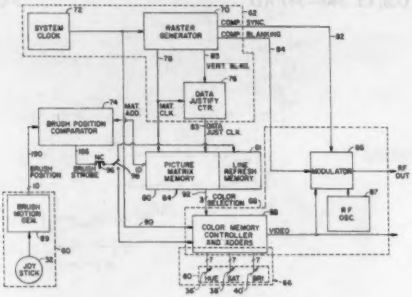
Filed Apr. 3, 1978, Ser. No. 893,102
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—703 **38 Claims**

1. A system for generating electronic signals representing an original color video image for display in a conventional video signal color display device such as a television receiver, said system comprising:

means for producing said electronic signals for display in response to color value input signals;

first memory means coupled to said signals producing means and having first memory elements, said first memory elements being constrained to store only a representation of a single preselectable color value for display;

second memory means coupled to said first memory means and through said first memory means to said electronic signals producing means, said second memory means having second memory elements, said second memory elements corresponding to matrix locations of said video image, said memory elements being constrained to store



only a representation of a single preselected matrix image value which designates a single one of said first memory locations; and

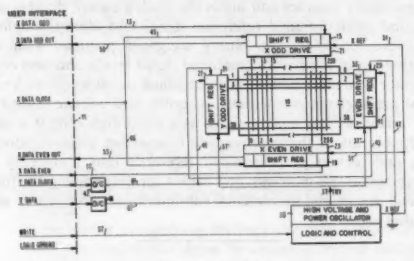
cursor means for manually generating said matrix image values in said second memory means independently of said color values such that each one of said image matrix locations is assigned a color value by reference to said first memory locations.

4,200,868

BUFFERED HIGH FREQUENCY PLASMA DISPLAY SYSTEM

William R. Lamoureux, Kingston; William J. Martin, Lake Katrine, and James B. Trushell, Saugerties, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,703
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—713 **9 Claims**



1. A refresh buffer plasma display system comprising in combination,

a plasma display device comprising first and second glass plates,

said plates being sealed under pressure and containing an ionizable gas,

said first and second plates having first and second dielectric coated arrays of parallel conductors respectively formed thereon,

said first and second conductor arrays being orthogonally disposed with respect to each other whereby the intersec-

tions of said orthogonal conductors define a matrix of gaseous discharge cells,

a high frequency signal source having a repetition rate above the wall charge response time of said gaseous discharge cells to prevent the accumulation of wall charge on said cells during operation of said device,

first and second drive-selection circuits associated with said first and second conductor arrays,

means responsive to control signals applied to said first drive-selection circuits for selectively conditioning conductors on one of said arrays in response to data signals applied thereto, and

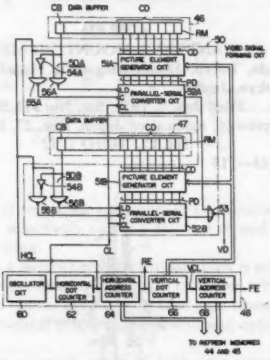
means responsive to control signals applied to said second drive-selection circuits for selectively and sequentially scanning a plurality of conductors in said second array with said high frequency signal source and applying drive signals referenced to said high frequency signal source to selected lines whereby selected cells in said array are ionized by coincidence of said conditioning and said scanning signals.

4,200,869

DATA DISPLAY CONTROL SYSTEM WITH PLURAL REFRESH MEMORIES

Norio Murayama, Katsuta; Yukitaka Hayashi, Hitachi; Nagaharu Hamada, Hitachi, and Toshitaka Hara, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 14, 1978, Ser. No. 877,803
Claims priority, application Japan, Feb. 14, 1977, 52-14875
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—723 **5 Claims**



1. A data display control system comprising:

a plurality of refresh memories capable of memorizing display data for one frame, individual display data having at least one display control bit for memorizing a display designating data information which determines whether or not the corresponding display data are to be displayed,

a write-in control unit for controlling the writing of the display designating data information into respective display control bits within the respective refresh memories,

a timing control circuit for successively and controllably performing the simultaneous reading-out of respective display data memorized in the plurality of refresh memories in time with the display,

at least one display judging circuit for judging whether or not the respective display data read out of the respective refresh memories are to be displayed on the basis of the contents of the corresponding display control bit,

a video signal forming circuit for converting into video signals the display data read out of the respective refresh memories which are permitted to be displayed by said display judging circuit and composing the video signals, and

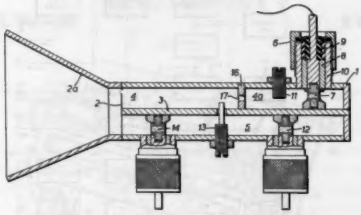
a display means for displaying the video signals from the video signal forming circuit under the control of the timing control circuit.

4,200,870

MICROWAVE COMPONENTS

Colin Gabbitas, Malmesbury, England, assignor to Bridgend Processes Limited, London, England

Filed Oct. 10, 1978, Ser. No. 950,163
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 PD **15 Claims**



1. A microwave transmitting and receiving device, comprising

(a) an elongated hollow waveguide shell member open at one end and containing a chamber, said shell member having in vertical transverse cross section a rectangular configuration including opposed pairs of major and minor walls, respectively;

(b) planar plate means arranged within said chamber between, parallel with, and spaced from said major walls, said plate means bisecting said chamber to define a pair of waveguides having the same dimensions, respectively;

(c) microwave oscillator diode means arranged within one of said waveguides for transmitting radiation to said open end;

(d) microwave detector diode means arranged within the other of said waveguides for receiving radiation from said open end; and

(e) means for mounting said diode means within said pair of waveguides, respectively, said mounting means being connected with said plate means and said opposed major wall of said shell member, respectively, whereby radiation from said oscillator diode means is transmitted from said transmitting waveguide to said open end, and radiation is received by said detector diode means via said receiving waveguide.

4,200,871

ACQUISITION SYSTEM FOR CONTINUOUS-WAVE FREQUENCY MODULATION OBJECT DETECTOR

Robert S. Roeder, Dunedin, Fla., and Lucien C. Bomar, II, Marietta, Ga., assignors to Sperry Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 811,110, Jun. 29, 1977, abandoned. This application May 15, 1978, Ser. No. 906,291
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—7.4 **13 Claims**

1. In a high frequency target detector system having antenna means for conically scanning about a boresight direction and coupled to receiver means:

transmitter carrier oscillator means coupled to said antenna means and to said receiver means,

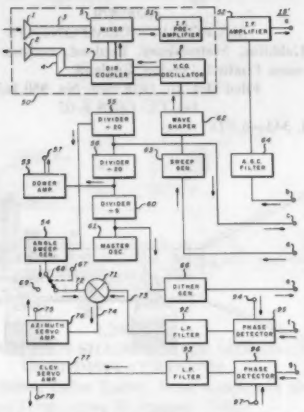
master oscillator means,

drive means responsive to said master oscillator means for conically scanning said antenna means at a first rate,

sweep generator means responsive to said master oscillator

means for frequency modulating said transmitter carrier at a second rate,

azimuth motive means responsive to said master oscillator means for cylically sector scanning said antenna means in azimuth at a third rate,



said sweep generator means, said azimuth motive means, and said conical scanning of said antenna means being operated in synchronous relation, and

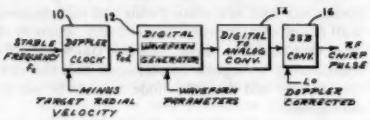
utilization means coupled to the output of said receiver means.

4,200,872

DOPPLER COMPENSATED DIGITAL NON-LINEAR WAVEFORM GENERATOR APPARATUS

Thomas P. Sifferlen, and Fritz Steudel, both of Sudbury, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 13, 1978, Ser. No. 968,895
Int. Cl.[2] G01S *9/02, 7/28*
U.S. Cl. 343—7.5 **4 Claims**



1. In a radar system, a Doppler compensated digital waveform generator apparatus comprising in combination:

a clock means for receiving a stable frequency and target radial velocity data, said clock means combining said stable frequency and said target radial velocity data to provide a CW output signal, said CW output signal comprising a frequency which is a function of target velocity,

means for generating a digital waveform, said digital waveform generating means receiving said CW output signal and waveform data, said digital waveform generating means being responsive to said CW output signal and said waveform data to provide a digital waveform output signal,

a d/a converter means connected to said digital waveform generating means to receive said digital waveform output signal, said d/a converter means converting said digital waveform output signal to an analog output signal, and,

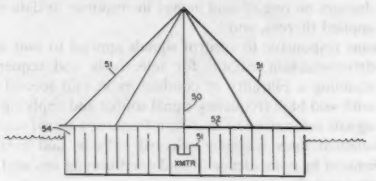
a single-sideband converter means translating said analog output signal to an RF output.

4,200,873

FOLDED TAPERED COAXIAL CAVITY-BACKED ANNULAR SLOT ANTENNA

Elwin W. Seeley, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 5, 1978, Ser. No. 939,734
Int. Cl.[2] H01Q *1/34, 13/18*
U.S. Cl. 343—710 **6 Claims**



1. An antenna for transmitting VLF/ELF energy comprising:

first and second cylinders positioned with respect to each other to form a circular slot,

a plurality of concentric cylinders alternately attached to said first and second clyinders forming a folded coaxial cavity coupled to said first and second cylinders for tuning the antenna to resonance; and

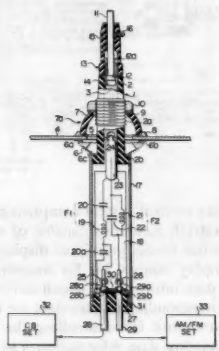
top loading means comprising a conducting hemisphere attached to one of said first and second cylinders to increase the radiation efficiency of said antenna.

4,200,874

CAR ANTENNA MOUNTING MEANS

Jiro Harada, Tokyo, Japan, assignor to Harada Industry Co., Ltd., Tokyo, Japan

Filed Jun. 1, 1978, Ser. No. 911,397
Claims priority, application Japan, Dec. 27, 1977, 52-159899
Int. Cl.[2] H01Q *1/32*
U.S. Cl. 343—715 **7 Claims**



1. An antenna system for mounting to a car body wall with a low capacitance between a central conductor of the antenna and the car body wall, comprising:

a mounting base having a cylindrical electrical insulator and a conductor fitted in said insulator, the cylindrical insulator extending from within a car body to outside the car body through an opening in a car body wall, the cylindrical insulator having a flange portion at the end portion thereof positioned within the car body and a threaded portion formed on the outer wall at the end portion thereof positioned outside the car body;

a metallic fixing nut threadably engaged with the threaded

portion of the cylindrical insulator, the cylindrical insulator electrically isolating the fixing nut from the conductor of the mounting base;

an upper mounting element comprising an electrically insulating elastic material located outside the car body and disposed between the fixing nut and the car body wall and electrically isolating the fixing nut from the car body wall;

a metallic lower mounting element located inside the car body and disposed between the flange portion of the cylindrical insulator and the car body wall for fixing the mounting base to the car body wall in accordance with driving force of the fixing nut;

a rod antenna element mounted to that portion of the mounting base which is positioned outside the car body, the rod antenna element being electrically connected to the conductor of the mounting base;

a connecting terminal for a CB transceiver electrically connected to the rod antenna element; and

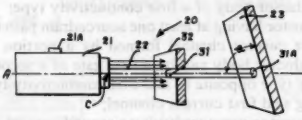
a loading coil for CB radio waves disposed within the car body wall and wall and connected between the conductor of the mounting base and the CB transceiver connecting terminal.

4,200,875

APPARATUS FOR, AND METHOD OF, RECORDING AND VIEWING LASER-MADE IMAGES ON HIGH GAIN RETROREFLECTIVE SHEETING

Demosthenes G. Galanos, Ft. Walton Beach, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 31, 1978, Ser. No. 929,468
Int. Cl.[2] G01D *15/00*
U.S. Cl. 346—1.1 **7 Claims**



5. A method of recording a plurality of preselected patterns and, thereafter, selectively viewing any one of said recorded patterns, comprising:

a. positioning a laser whereby when said laser is activated, it emits an output beam of laser light radiation, wherein said laser has an optical axis and said laser light beam radiation has a longitudinal axis coincident with said optical axis of said laser;

b. positioning a target, made of high gain retroreflective sheeting of the exposed-lense type, in optical alignment with said laser and with said laser light beam radiation, whereby when said laser is activated, said emitted laser light beam radiation impinges upon said target;

c. interposing, individually and separately, each one of a plurality of different preselected patterns, between and in optical alignment with, said laser and said target, wherein each of said patterns is smaller than said target;

d. inclining said target at a previously chosen and different angle, with relation to said optical axis of said laser and said coincident longitudinal axis of said laser light beam radiation, for each one of said plurality of different preselected patterns, individually and separately;

e. activating said laser, while each one of said different preselected patterns is interposed, individually and separately, between said laser and said target, whereby said emitted output laser light beam radiation impinges upon said interposed pattern and, thereafter, impinges upon said inclined target, thereby recording, sequentially and separately on said target, by structurally altering said target material, an image of each of said patterns;

f. deactivating said laser;

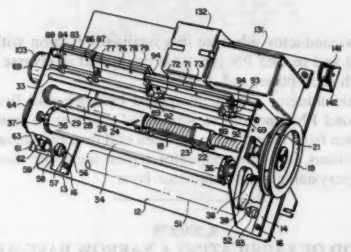
g. and, viewing, selectively, separately and individually, any one of said recorded images of said patterns by inclining said target at the same angle at which said target was inclined when said selected image of said pattern was recorded on said target by said structural alteration of said target material by said laser light beam radiation.

4,200,876

WATER LEVEL RECORDER

John D. Gearheart, Orangevale, and Frederic W. Jenkinson, Carmichael, both of Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Filed Feb. 13, 1978, Ser. No. 877,240
Int. Cl.[2] G01D *9/30*
U.S. Cl. 346—49 **8 Claims**



1. In a water level recorder for use with chart paper, a framework, a single lead screw rotatably mounted in the framework, a pulley secured to the lead screw, a tape engaging the pulley and being positioned by a float adapted to rest upon the water, a lead screw nut mounted on the lead screw for movement longitudinally of the lead screw as the lead screw is rotated, a marking member carried by the lead screw nut, a drum secured to the lead screw for rotation with the lead screw, a helix formed on the drum, an additional drum in axial alignment with the first named drum and rotatably mounted with respect to the first named drum, a helix formed on the additional drum, means for advancing the additional drum independent of the float for giving an indication of another parameter being measured, means adapted to engage the chart paper and for advancing the chart over the helix of the first named drum, the helix of the additional drum and the marking member, means adapted to engage the chart paper to retain it in direct engagement with the marking member and the helix of the first named drum so that two traces are formed on the chart paper as the chart paper is advanced one by the marking member and one by the helix of the first named drum to give course and vernier indications respectively of the water level being measured and means adapted to engage the chart paper to retain it in engagement with the helix on the additional drum so that an additional trace is formed on the chart paper of the additional parameter.

4,200,877

TEMPERATURE-COMPENSATED VOLTAGE REFERENCE DIODE WITH INTERMEDIATE POLYCRYSTALLINE LAYER

Takaya Suzuki; Mitsuru Ura, and Takuzo Ogawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1977, Ser. No. 860,118
Claims priority, application Japan, Dec. 23, 1976, 51-155335
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 **11 Claims**

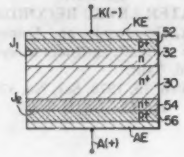
1. A temperature-compensated voltage-reference diode comprising:

a semiconductor substrate;

a first PN junction having a given zener breakdown voltage

and having a first temperature coefficient, said first PN junction being reverse-biased;

a second PN junction for temperature compensation having a second temperature coefficient of opposite sign to said first temperature coefficient of said first PN junction and being forward-biased, said second PN junction together with said first PN junction being integrally formed in said



semiconductor substrate in a laminated fashion with said first and second PN junctions connected in inverse series with each other; and

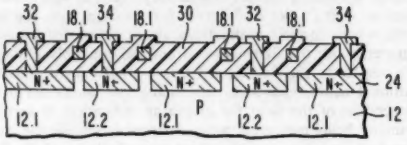
a semiconductor region interposed between said first and second PN junctions to substantially prevent a transistor action from taking place between said first and second PN junctions, said semiconductor region including therein a polycrystalline semiconductor layer.

4,200,878

METHOD OF FABRICATING A NARROW BASE-WIDTH BIPOLAR DEVICE AND THE PRODUCT THEREOF

Alfred C. Ipri, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 12, 1978, Ser. No. 914,901
Int. Cl.² H01L *21/223, 21/26, 29/72*
U.S. Cl. 357—35 **2 Claims**



1. A method for fabricating a narrow basewidth bipolar semiconductor device having base, emitter and collector regions, comprising the steps of:

providing a semiconductor body of a given conductivity type, the body having a common boundary surface;

depositing a layer of oxide on the common boundary surface;

depositing a layer of polycrystalline silicon on the oxide layer;

depositing a layer of masking material on the polycrystalline silicon layer;

forming apertures in the masking material;

etching the unmasked portions of the polycrystalline silicon layer down to the layer of oxide to expose unetched edges of polycrystalline silicon under the masking layer;

doping the exposed edges of the unetched polycrystalline silicon layer to form a narrow line of doped polycrystalline silicon in the polycrystalline silicon layer, the narrow doped line defining the limits of the width of the base region;

doping the semiconductor body, through the oxide layer exposed by the etched unmasked portions of the polycrystalline silicon layer, to an opposite conductivity type to form emitter regions;

removing the layer of masking material;

etching the undoped portions of the polycrystalline silicon layer;

doping the semiconductor body, through the oxide layer exposed by the last etched portions of the polycrystalline silicon layer, to an opposite conductivity to form the collector region while simultaneously further doping the emitter regions; and

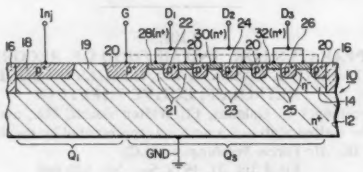
providing the semiconductor body and each doped region with a respective ohmic contact.

4,200,879

INTEGRATED SEMICONDUCTOR DEVICE INCLUDING STATIC INDUCTION TRANSISTOR

Terumoto Nonaka; Tadahiko Hotta, and Shin Yamashita, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 26, 1978, Ser. No. 954,917
Claims priority, application Japan, Nov. 5, 1977, 52/132756
Int. Cl.² H01L *27/04*
U.S. Cl. 357—43 **6 Claims**



1. In an integrated semiconductor device of the injection logic type comprising:

a semiconductor body of a first conductivity type;

a first transistor having at least one sourcedrain path to serve as a first current channel formed by a portion of said semiconductor body and by a first gate of a second conductivity type opposite to said first conductivity type and adjoining said first current channel;

a current injector structure having a second current channel formed by a portion of said semiconductor body and connected to said first gate for injecting, in response to a biasing potential applied to said current injector structure, charge carriers into said first gate to forwardly bias this first gate relative to said first current channel; and

control means connected to said first gate for controlling the conduction of said first current channel,

the improvement lies in that: said first gate surrounds said first current channel and at least one second gate of said second conductivity type which is electrically floating is formed in said first current channel to be surrounded by the latter so that said first and second gates oppose each other with said first current channel intervening therebetween, thereby developing depletion layers into said first current channel to substantially pinch-off the latter without a biasing potential at said first gate.

4,200,880

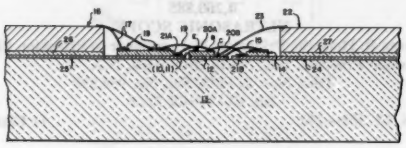
MICROWAVE TRANSISTOR WITH DISTRIBUTED OUTPUT SHUNT TUNING

Richard H. Frey, Hampton, N.J., assignor to Microwave Semiconductor Corp., Somerset, N.J.

Filed Mar. 28, 1978, Ser. No. 891,009
Int. Cl.² H01L *27/02*
U.S. Cl. 357—51 **13 Claims**

1. An improved microwave transistor device of the type having an output capacitance and comprising emitter means, base means, isolated collector means contacting an elongated collector electrode, and separate ground contact means for the input side and for the output side of the device, said improvement comprising:

an elongated, grounded, DC blocking capacitor substantially co-extensive with said elongated collector electrode;
conductive means connecting said base means to said ground contact means for the input side of the device;
conductive means connecting said base means to said ground contact means for the output side of the device; and



a plurality of inductive means substantially uniformly spaced along the length of said elongated collector electrode connecting said electrode to said blocking capacitor to provide uniformly distributed inductances shunting said output capacitance, said inductive means having an inductive reactance substantially shunt tuning the capacitive reactance of said output capacitance at a desired operating frequency.

4,200,881

ENCODING AND TRANSCODING APPARATUS FOR VIDEO DISC SYSTEMS

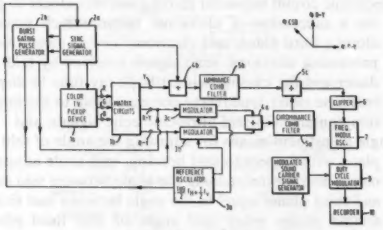
Peter S. Carnt, Neerach; Ernst A. O. Rutishauser, Widen, and Jorg Schiess, Stallikon, all of Switzerland, assignors to RCA Corporation, New York, N.Y.

Filed Aug. 8, 1977, Ser. No. 822,659

Claims priority, application United Kingdom, Aug. 9, 1976, 33120/76

Int. Cl.[2] H04N *5/79, 9/46, 9/02*

U.S. Cl. 358—4 **15 Claims**



1. Composite color video signal forming apparatus for use with a source of correlated signals representative of a color image analyzed by a raster scanning process at given line and field frequencies, said signals including a luminance signal, and first and second color-difference signals; said apparatus comprising:
means for developing oscillations of a given frequency substantially corresponding to an odd integral multiple of half said line frequency;
means for modulating an output of said oscillation developing means having a first phase in accordance with said first color-difference signal;
means for modulating an output of said oscillation developing means having a second phase, in quadrature with said first phase, in accordance with said second color-difference signal;
means for combining the outputs of both of said modulating means to develop a signal representative of the chrominance of said color image; and
means for causing the formation of a composite color video signal inclusive of said luminance signal, said chrominance signal, and a color synchronizing signal comprising a sequence of recurring bursts of oscillations of said given frequency and of a constant phase differing from said first phase by 45°.

4,200,882

COLOR TELEVISION CRT BEAM CURRENT CORRECTION CIRCUIT

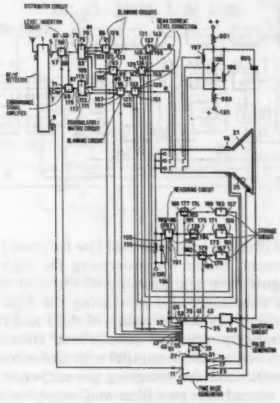
Peter J. H. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 28, 1978, Ser. No. 929,021

Claims priority, application Netherlands, Aug. 25, 1977, 7709362

Int. Cl.[2] H04N *9/20*

U.S. Cl. 358—29 **4 Claims**



1. A colour television display apparatus including a beam current reference level control circuit comprising a measuring circuit included in the cathode circuits of the electron guns of a multi-gun colour display tube for measuring during a measuring period the beam current reference level to be corrected, a level insertion circuit for providing during this measuring period a reference level in a video signal to be applied to each gun of the display tube, and a beam current level correction circuit coupled to the measuring circuit and to a control electrode of each gun of the display tube for obtaining substantially the same beam current reference level in each of the electron guns, wherein said control circuit further comprises a level shift circuit coupled to the electron guns of the display tube for shifting, at each electron gun over substantially the same amount, the mutual position of the reference level in the video signal and a setting voltage of the electron gun occurring outside the measuring period, relative to that mutual position during the measuring period.

4,200,883

SOLID STATE COLOR TELEVISION CAMERA

Seisuke Yamanaka, Mitaka; Fumio Nagumo, Yokohama, and Toshimichi Nishimura, Tama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1977, Ser. No. 831,155

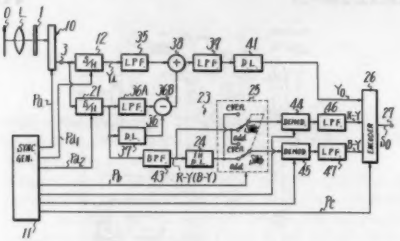
Claims priority, application Japan, Sep. 16, 1976, 51-111106

Int. Cl.[2] H04N *9/07*

U.S. Cl. 358—44 **5 Claims**

1. A solid state television camera having a solid state image sensing device including a plurality of individual light sensing units arranged in both horizontal and vertical rows, said camera comprising means for establishing an image light path for casting an image on said image sensing means, a filter through which said image light passes before impringing on said image sensing means and having a plurality of color filter elements coincident with said individual light sensing elements being

arranged in horizontal rows within said light path with first alternate rows having alternating first segments for passing light of all colors (luminance light) and second segments to pass a first primary color and said first and second segments having different light transmissivity characteristics, second alternating horizontal filter rows having alternating third segments for passing light of a second primary color and fourth segments for passing light of all colors (luminance light), means for processing from carrier signals produced by said plurality of filter elements a low frequency luminance signal component of the luminance signal including a first sample/hold circuit and a first low pass filter, adding means receiving from the



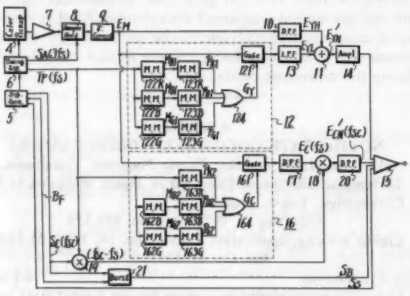
output of said first low pass filter said low frequency luminance signal component, means for processing the high frequency luminance signal from said plurality of first and second filter elements and alternately also processing the high frequency luminance signal from said plurality of third and fourth filter elements comprising a second sample/hold circuit, a second low pass filter, a delay line in parallel with said second low pass filter, and a subtractor for receiving the output of said delay line and said second low pass filter and supplying an input to said adder means, the output of said adder producing an entire luminance signal component including the high frequency and low frequency components.

4,200,884

SIGNAL PROCESSING SYSTEM FOR A SOLID STATE TELEVISION CAMERA

Fumio Nagumo, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 13, 1978, Ser. No. 915,253
Claims priority, application Japan, Jun. 16, 1977, 52-71544
Int. Cl.[2] H04N 5/02, 9/535
U.S. Cl. 358—11 **5 Claims**



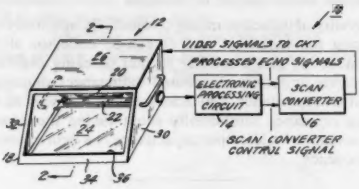
1. A signal processing system for a solid state image sensor including an accumulation and for controlling the sensitivity of the image sensor under dynamic conditions comprising; a solid state imaging device means having a predetermined number of picture elements aligned in both the horizontal and vertical directions, means for deriving an output signal from said solid state imaging device means in response to an image projected thereon, and means for adjusting the pulse width of said output signal which has repeating cycles which are directly related to the alignment pitch of said picture elements in the horizontal direction and wherein said adjusting means is connected after accumulation has occurred.

4,200,885

ULTRASONIC SCOPE

Steven R. Hofstein, Princeton, N.J., assignor to Princeton Electronic Products, Inc., North Brunswick, N.J.

Filed Nov. 2, 1978, Ser. No. 956,899
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—112 **11 Claims**



1. An ultrasonic imaging system, comprising:

a housing having a viewing window formed therein;

a cathode ray tube mounted in said housing, said cathode ray tube including a generally planar viewing face lying in a first plane;

a planar mirror mounted in said housing and lying in a second plane, one of said mirror and cathode ray tube being pivotally mounted such that the angle between said first and second planes is adjustable;

a transducer pivotally mounted in said housing;

electronic circuit means for causing said transducer to generate a succession of ultrasonic beams which propagate along a third plane, said electronic circuit means also for processing ultrasonic echo signals received by said transducer and for causing said cathode ray tube to display a real time raster type image corresponding to the information contained in said ultrasonic echo signals; and

angle adjustment means for adjusting the angle of said third plane with respect to said housing, said angle adjustment means also for maintaining the angle between said second and third planes equal to the angle between said first and second planes when said angle of said third plane is changed with respect to said housing.

4,200,886

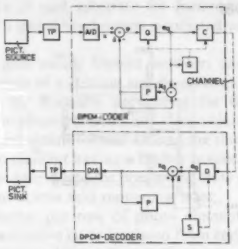
METHOD FOR TRANSMITTING VIDEO SIGNALS WITH THE AID OF DPC MODULATION AND CONTROLLED QUANTIZER

Hans-Georg Musmann, Salzgitter-Bad, and Wolf-Dieter Erdmann, Achim, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,048
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1977, 2740945
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—135 **3 Claims**

1. In a method for transmitting video signals by differential pulse code modulation employing an adjustable quantizer which can be switched between different quantizing characteristics, the improvement comprising: deriving the control criterion for switching the quantizer from the quantized prediction errors based on picture elements adjacent the picture element being quantized; providing the quantizer with a large number of available quantizing representative levels and employing a

selected number of those levels, less than the total available, for each quantizing characteristic; and, omitting those representative quantizing levels of the quantizer, for which the spacing between the representative levels is less than twice the associ-



ated maximum permissible quantizing error belonging to the respective quantized prediction errors and providing representative levels at the outer ends of the quantizing characteristic instead of the omitted levels.

4,200,887

TELEVISION CAMERA

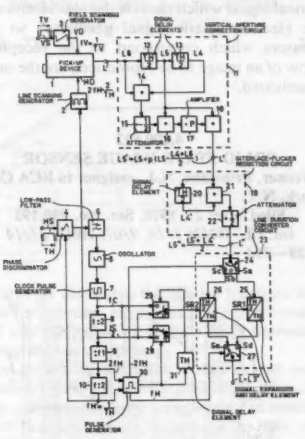
Pieter M. Van Den Avoort, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,517

Claims priority, application Netherlands, Sep. 2, 1977, 7709662

Int. Cl.[2] H04N 5/14

U.S. Cl. 358—152 **6 Claims**



1. A television camera comprising a picture pick-up device, a line scanning signal generator and a field scanning signal generator each coupled to the picture pick-up device for the line-by-line and field-by-field conversion of optical picture information into a video signal occurring with line and field periods as specified in television standards, and a signal processing circuit coupled to the output of said picture pick-up device for improving the picture quality on display by combining information of adjacent lines for forming the video signal, and a line duration converter circuit coupled to the output of the signal processing circuit, wherein the line scanning frequency as provided by the line scanning signal generator is twice the standard line frequency as specified in television standards, so that the same, non-interlaced line raster occurs at the picture pick-up device in each standard field period, the video signal output of the pick-up device, the video signal occurring at double the standard line frequency and at the standard field frequency, being first processed in said signal processing circuit, and then being converted in said line duration converter circuit from a signal with half the standard line periods into a video signal with the standard line periods.

4,200,888

TELEVISION CAMERA CIRCUIT COMPRISING A GAMMA AND AN APERTURE CORRECTION CIRCUIT

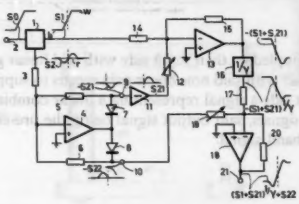
Hendrik Blom, Breda, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,315

Claims priority, application Netherlands, Nov. 28, 1977, 7713050

Int. Cl.[2] H04N 5/14, 5/20

U.S. Cl. 358—162 **2 Claims**



1. A television camera circuit comprising a gamma and aperture correction circuit for a television picture signal, the aperture correction circuit being provided with a correction signal generator for deriving, from the picture signal varying between a black level and a peak-white value, an aperture correction signal having a negative and a positive-going signal value relative to a reference value, wherein the aperture correction circuit comprises a first and second terminal, at which an aperture correction signal occurs, associated with said positive and negative-going correction signal value, respectively, a first superposition stage having a first and a second input and an output, the first terminal being connected to the first input of the first superposition stage, the picture signal being applied to the second input thereof and the output of the first superposition stage being connected to the input of the gamma correction circuit, and a second superposition stage having a first and a second input and an output, the second terminal being connected to the first input of the second superposition stage, the second input of which being connected to the output of the gamma correction circuit, and the output of the second superposition stage carrying an aperture and gamma-corrected picture signal.

4,200,889

COMPLEMENTARY PRE-EMPHASIS AND DE-EMPHASIS CIRCUITS FOR A VIDEO SIGNAL TRANSFER CHANNEL

Caljon H. Strobele, Santa Ana, Calif., assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,757

Int. Cl.[2] H04N 9/53

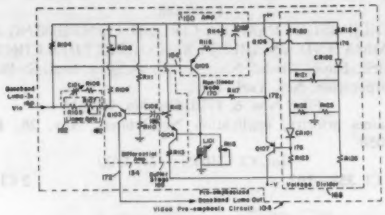
U.S. Cl. 358—167 **22 Claims**

1. In a wide band signal transfer system including a wide band signal transfer channel which is subject to unwanted noise across the wide band, pre-emphasis means for increasing, prior to introduction of said signal into said channel in pre-emphasized form, the amplitude of higher-frequency wide band signal components relative to lower-frequency wide band signal components without overdriving of the transfer channel, said pre-emphasis means comprising:

input connections for receiving a signal having a wide band of frequencies within a predetermined amplitude range;

means coupled to said input connections for subjecting said wide band signal to a predetermined linear gain;

further means coupled to said input connections for subjecting said wide band signal to a non-linear gain, said non-linear gain being a direct function of the frequency and a switched function of the amplitude of the high frequency components of said wide band signal; and



means coupled on their input side with said linear gain means and also with said non-linear gain means to supply at their output side a signal representing a linear combining of the input signals, said output signal being the pre-emphasized wide band signal.

4,200,890

DIGITAL VIDEO EFFECTS SYSTEM EMPLOYING A CHROMA-KEY TRACKING TECHNIQUE

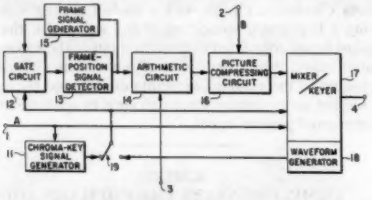
Masao Inaba, and Kazuo Kashigi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jul. 7, 1978, Ser. No. 922,634

Claims priority, application Japan, Jul. 11, 1977, 52-83285; Jul. 11, 1977, 52-83286

Int. Cl.[2] **H04N** *5/22, 9/535*

U.S. Cl. 358—183 **5 Claims**



1. A tracking system for producing special effects on a television picture, picture comprised of a first picture and a second picture inserted into said first picture, said first and second pictures being represented by first and second video signals respectively, said system comprising: means for producing a key signal representing a key frame to be positioned on said first picture; means responsive to said key signal for producing a position signal representing a position of a circumscribed frame of said key frame; means responsive to said position signal for producing an imaginary-frame position signal representing an imaginary frame greater than said key frame; means responsive to said second video signal and said imaginary-frame position signal for producing a compressed second video signal representing a compressed second picture, said compressed second picture being identical in size to said imaginary frame; and means responsive to said key signal for selectively combining said first video signal and said compressed second video signal, whereby to said special effects are produced.

4,200,891

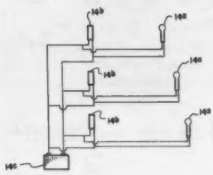
ELECTROMAGNETIC BOND PHOTOCOPY DEVICE

Gordon Burton, 1262 Bluebird, Salt Lake City, Utah 84107

Filed May 16, 1978, Ser. No. 906,677

Int. Cl.[2] **G01D** *15/06*

U.S. Cl. 358—301 **3 Claims**



1. An image reproducing device comprising:

an electromagnetic energy radiating device;

an image receptor plate having a substantial plurality of minute discrete receptors activated by said electromagnetic energy to produce individual electrical signals;

means to transmit said electrical signals to an image producing plate;

means to produce a bias electrical signal to each electromagnetic signal generator on an image producing plate; and

an image producing plate having a comparable number of minute discrete electromagnetic signal generators, each of said generators connected to a companion receptor so that activation of a particular pattern of receptors produces an identical pattern of activated generators on the image producing plate, said activated receptors producing an electrical signal which cancels the bias electrical signal to those electromagnetic signal generators so that those generators which correspond to the receptors in the shadow of an image to be reproduced are the only generators activated.

4,200,892

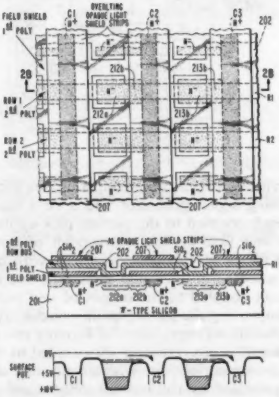
SOLID STATE IMAGE SENSOR

Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1978, Ser. No. 890,193

Int. Cl.[2] **H04N** *3/14, 9/07;* **H01L** *27/14*

U.S. Cl. 358—213 **4 Claims**



1. A solid state image sensor comprising:

a substrate;

a matrix array of photo sensitive elements, formed along one surface of said substrate, arranged in rows and columns,

a column conductor per column of photo elements formed in said one surface of said substrate,

a first conductive layer insulated from and overlying said one surface of said substrate for forming a barrier gate means and a guard band means associated with each photo element;

said barrier gate means formed between one side of each photo element of a column and its corresponding column conductor for normally preventing the flow of charge between the photo elements and their column conductors;

said guard band means formed around the remaining sides of each photo element having a higher potential barrier than said barrier gate means for preventing flow of charge from the element across said remaining sides;

a row conductor per row of photo elements formed of a second conductive layer insulated from and overlying said first conductive layer also overlying its corresponding row of elements; and

means for applying driving voltages to said row conductors for, during one time interval, placing said photo sensitive elements in a charge integration mode, and for, during another time interval, causing the integrated charge of each element of a row to rise above the potential barrier of said barrier gate and to flow via a conductive path into said column conductors.

4,200,893

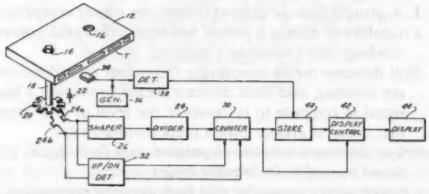
INSTRUCTION INDICATING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Gary G. Matison, Wilton, Conn., assignor to Dictaphone Corporation, Rye, N.Y.

Filed May 17, 1978, Ser. No. 907,035

Int. Cl.[2] G11B *15/18*

U.S. Cl. 360—72.1 **34 Claims**



1. Apparatus for displaying the relative locations of particular information recorded on a movable record medium, the presence of said particular information being represented by a predetermined signal, comprising:

means for generating electronic pulses as said record medium moves past a reference position, each pulse representing a predetermined amount of record medium;

electronic counting means responsive to said electronic pulses for counting said pulses, the count of said counting means being selectively incremented or decremented in accordance with the direction of movement of said record medium;

means responsive to said predetermined signal for providing an indicating signal;

memory means having a plurality of addressable storage locations for storing indicating signals, the count of said counting means serving as an address for said memory means so that said indicating signal, if provided, is stored at a storage location determined by the present count of said counting means at the time that said indicating signal is produced; and

display means responsive to the signals stored in said memory means for displaying the locations on said record medium at which said predetermined signals are recorded so as to provide a single visual appearance of all of said locations at which said predetermined signals are recorded.

4,200,894

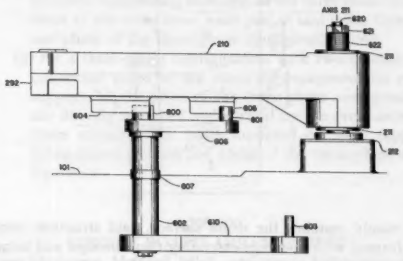
HEAD ADJUSTMENT MECHANISM FOR RIGID MAGNETIC DISC MEMORY APPARATUS

Robert Kaseta, Stow; Lenn Daugherty, Northboro; Sigmund Hinlein; Michael Feldstein, both of Sudbury, and Harold Thackaberry, Franklin, all of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Apr. 24, 1978, Ser. No. 899,045

Int. Cl.[2] G11B *5/54, 5/48, 5/6, 21/24*

U.S. Cl. 360—106 **9 Claims**



1. In memory apparatus supported by a base and intended for use in a digital computer system, said apparatus comprising at least one spinable and rigid magnetic disc for recording digital information, magnetic head means for reading said information from and writing said information into said disc; positioning means for accurately positioning said magnetic head means parallel and adjacent to the plane of said disc; said positioning means comprising:

supporting means movably mounted on said base and movable in directions parallel to and perpendicular to the plane of said disc for supporting said magnetic head means in an initial position offset perpendicularly from said plane of said disc;

stepper motor means including a stepper motor mounted on said base responsive to electrical signals from said computer system for providing mechanical step motion;

inelastic, taut band means for coupling said step motion to said movably mounted supporting means in the direction parallel to the plane of said disc, whereby said head means is stepped along said disc surface; and

shim means for displacing said supporting means in the direction perpendicular to the plan e of said disc to accurately adjust the adjacent relationship between said magnetic head means and said disc to a predetermined final position.

4,200,895

SCANNING HEAD STRUCTURE FOR WIDE BAND MAGNETIC RECORD/REPRODUCING TAPE AND METHOD OF ITS MANUFACTURE

Arno Repp, Darmstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 23, 1978, Ser. No. 889,236

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1977, 2713582

Int. Cl.[2] G11B *5/52, 15/60*

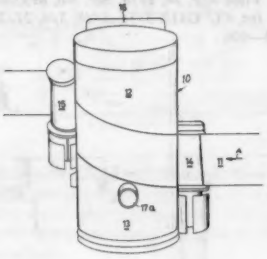
U.S. Cl. 360—107 **24 Claims**

1. Scanning head structure for wide band magnetic recording/reproducing tape (**11**), particularly for video tape recording having

a stationary cylindrical guide drum (**10**) formed with two cylindrical portions (**12, 13**) axially separated by a gap and means (**14, 15**) guiding the tape about a portion of the circumference of said drum in a spiral path, said drum

being adapted to have a transducer head wheel rotatable therein in a plane transverse to the axis of the cylindrical drum to scan an inclined path across the tape as the tape moves over the drum; and

a block-like support structure (**16**) separable from said drum located adjacent a portion of the surface of the drum extending axially alongside the drum and positioning the portions (**12, 13**) of the drum with respect to each other and having a surface facing the drum which approxi-



mately matches the drum surface, said structure being formed with openings extending therethrough and terminating at the surface thereof facing the guide drum (**10**); and bearing seats (**17, 18, 19, 20; 21, 22, 23, 24**) comprising a hardened cast, or molded material located in said openings, projecting from the surface of the block-like structure facing the drum and in engagement with the portions (**12, 13**) of the drum and accurately positioning said portions on and with respect to the block-like structure (**16**).

4,200,896

METHOD AND SYSTEM FOR CONTROLLING A MULTI-SEGMENT INDICATOR TO FURNISH AN ANALOGUE DISPLAY INDICATING ONLY THE RELATIONSHIP OF THE MEASURED VALUE TO A DESIRED VALUE OR RANGE OF VALUES

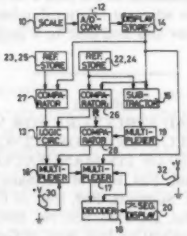
Arthur Baumann, Zurich, Switzerland, assignor to Mettler Instrument AG, Greifensee-Zurich, Switzerland

Filed Aug. 21, 1978, Ser. No. 935,368

Claims priority, application Switzerland, Aug. 26, 1977, 10430/77

Int. Cl.[2] **G09F** *9/32;* **G06F** *15/20*

U.S. Cl. 364—570 **20 Claims**



1. In a measuring system having display means for furnishing a digital display of the measured value, said display means having a set of horizontal segments including a first and second subset forming, respectively, a first and second horizontal line of said digital display, and a set of vertical segments including a first and second subset respectively forming a first and second vertical line in said digital display;

apparatus for operating said display means to furnish a display indicative of the relationship of said measured value to a desired value, said apparatus comprising input means for inputting said desired value to said system;

means connected to said input means for comparing said measured value to said desired value and furnishing a first or second comparator output signal when said measured value has a first or second predetermined relationship to said desired value, respectively;

means for temporarily deactivating a selected one of said segment sets and

for activating said first or said second subset of said remaining one of said sets in response to said first or second comparator output signal, respectively.

4,200,897

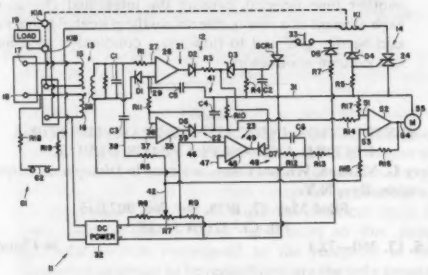
GROUND LEAKAGE CURRENT INTERRUPTER

Robert E. Dawley, 123 Bacon St., Natick, Mass. 01760

Filed May 15, 1978, Ser. No. 906,247

Int. Cl.[2] **H02H** *3/28*

U.S. Cl. 361—45 **17 Claims**



1. A ground leakage current interrupter circuit comprising:

a transformer having a pair of balanced differential primary windings and a secondary winding;

fault detector means monitoring the output of said secondary winding, said fault detector means producing a fault signal in response to increases in the level of said output that occur at greater than a predetermined rate;

circuit interrupter means responsive to a fault signal produced by said fault detector means;

a power supply means for said fault detector means; and

a turn-on delay means for de-activating said fault detector means to prevent the production of a fault signal for a predetermined time after energization of said power supply means.

4,200,898

CURRENT LIMITER

James P. Thompson, San Jose, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 19, 1978, Ser. No. 916,449

Int. Cl.[2] **H02H** *7/085*

U.S. Cl. 361—58 **11 Claims**

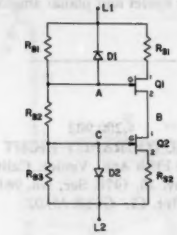
5. A current limiter for an a.c. circuit comprising:

(a) a first solid state device having symmetrical characteristics connected in series to the line side of said a.c. circuit;

(b) a second solid state device having symmetrical characteristics, said second solid state device being connected in cascode to said first solid state device and being connected in series to the load side of said a.c. circuit; and

(c) means connected between the line and the load sides of said a.c. circuit for biasing said first and said second solid state devices so that said first and said second solid state

devices act interchangeably as a current source and a unity gain buffer depending upon the polarity of the applied voltage so that the current of said a.c. circuit is limited by the saturation current of said solid state devices.



4,200,899

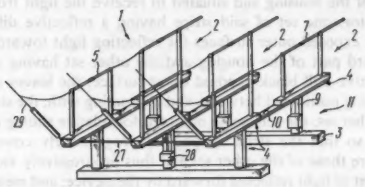
OUTDOOR HIGH-VOLTAGE SWITCHGEAR

Mikhail Y. Volman, Lunny pereulok 2, kv. 14; Vladimir Y. Grinshtein, ulitsa Sverdlova 132, kv. 31, both of Odessa; Mikhail L. Zhukov, kvartal 3, dom 28, kv. 5, Kuibyshev, and Ivan A. Kuchuk, ulitsa Engelsa 36, kv. 1, Odessa, all of U.S.S.R.

Continuation of Ser. No. 705,892, Jul. 16, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 917,306

Int. Cl.² H02B 1/04

U.S. Cl. 361—333 **5 Claims**



1. A high-voltage outdoor distribution installation of the type having electrical equipment electrically interconnected, including electrical equipment for connection to lead-ins from an electrical transmission line, said installation comprising:

(a) a plurality of three-phase modules being electrically interconnected including a module to be connected to lead-ins;

(b) each said module including

(i) a spatial frame and

(ii) a plurality of electrically insulated, equipment mounting poles mounted on said spatial frame;

(c) said spatial frame including:

(i) a pair of spaced part, unburied foundation beams arranged substantially on the ground level and with no pilings or anchors penetrating the earth's surface, said pair of unburied foundation beams having no mechanical interconnections therebetween in the plane of said beams; and

(ii) a plurality of supports attached to and supported by said pair of unburied foundation beams, each support including:

(1) a first vertically extending leg attached at its lower end to one of the pair of foundation beams,

(2) a second vertically extending leg attached at its lower end at a correspondingly opposite point on the other one of the pair of foundation beams, and

(3) a cross arm attached at spaced points to the upper ends of said vertically extending legs, bridging same so that each support is of generally an n-shape;

(d) electrical equipment formed by electrically insulated completely mounted poles; and

(e) a portion of the supports, at least two, attached to said pair of unburied foundation beams being correlated with said electrically insulated poles and said electrically insulated poles, at least two, being directly mounted on said cross arms such that

(i) for a three-phase configuration using two supports, at least three poles are directly mounted on and carried by the cross arm of each of said two supports, with the three electrical equipments mounted on the three poles on one of the cross arms being paired with the three electrical equipments mounted on the three poles on the other of the cross arms, each pair of said poles forming one phase of the three-phase configuration, and

(ii) for a three-phase configuration with two electrically connected poles of the electrical equipment on each support, all the poles of the three-phase configuration are directly mounted and carried by the cross-arms of three supports, the poles mounted on each support being paired to form one phase of the three-phase configuration.

4,200,900

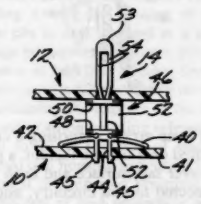
CIRCUIT BOARD ARRANGEMENT

Gram McGeorge, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 30, 1978, Ser. No. 920,960

Int. Cl.² H02B 1/02

U.S. Cl. 361—412 **7 Claims**



1. A printed circuit board arrangement comprising:

a planar primary circuit board having widely spaced apertures defined therein and containing electrical circuit components and auxiliary circuit board electrical interface terminations located in physical proximity to each other permanently mounted thereon;

mounting pins arranged in said widely spaced apertures to project outward from said primary circuit board;

a planar auxiliary circuit board having electrical components and primary circuit board electrical interface terminations arranged in physical proximity in a pattern corresponding to the arrangement of said auxiliary circuit board electrical interface terminations on said primary board, wherein said auxiliary circuit board is disposed in parallel arrangement relative to said primary circuit board, and has apertures therein to receive said mounting pins, which carry said auxiliary board in releasable locked engagement with said primary board by said mounting pins at a spaced distance from said primary circuit board to provide clearance for electrical components on said primary circuit board; and

a unitary interface connector having separate conductors to connect each of said corresponding ones of said auxiliary circuit board electrical interface terminations and said primary circuit board electrical interface terminations, and further characterized in that terminations of at least one of said circuit boards include sockets defined on the mounting surface thereof opposite the surface facing the

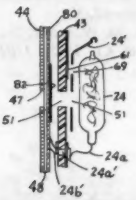
other board, and said sockets include a support partition extending outward away from said mounting surface, a back panel spaced from said support partition, apertures in said mounted surface spaced to receive said separate conductors, spring biased electrically conductive contact wires extending outward away from said mounting surface, over said support partition, back toward said mounting surface, and outward again in a loop residing against said back panel, and said contact wires are deflected by, and establish electrical contact with said conductors and said primary circuit board terminations are linearly arranged at spaced intervals and said auxiliary circuit board terminations are linearly arranged at identical spaced intervals and said connector includes a transverse support bar carrying a plurality of straight parallel conductor wires, each for joining terminations in said primary and auxiliary circuit board in releasable electrical connections.

4,200,901

MULTILAMP PHOTOFLASH UNIT WITH ELECTROSTATIC PROTECTION

John W. Shaffer; Daniel W. Bricker, and Emery G. Audesse, all of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 29, 1975, Ser. No. 644,674
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—5 **10 Claims**



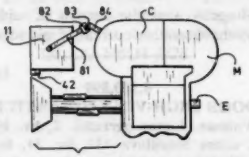
1. A photoflash lamp array comprising a circuit board having circuitry disposed on a surface thereof, a plurality of flashlamps positioned over said surface and each having a pair of lead-in wires connected to said circuitry, said circuitry being provided for igniting said flashlamps, said circuitry including a group of pairs of flashlamp contact areas and a common circuit conductor connected electrically with one contact area of each of said pairs thereof, a plurality of lead-through holes in said circuit board each associated with a respective one of said contact areas, a plurality of eyelets each secured in a respective one of said lead-through holes with the head of the eyelet rolled over onto the associated contact area and the other end of the eyelet projecting through to the opposite side of said circuit board, each of said flashlamp lead-in wires passing through a respective eyelet and secured thereto by a crimp in the projecting end of the eyelet, each pair of said flashlamp lead-in wires being electrically connected to a respective pair of said contact areas associated with said eyelets, said circuit board having a connector tab depending therefrom with first and second terminals thereon, said common circuit conductor being connected to the first terminal of said tab connector, means disposed on said circuit board surface for connecting the second terminal of said tab connector to the other contact area of each of said pairs thereof, a conductive shield of planar configuration disposed parallel to the plane of said circuit board and spaced therefrom on the side opposite said surface thereof whereby said projecting eyelets are shielded, and means for maintaining a substantially uniform spacing between said planar shield and said circuit board and for electrically connecting said planar shield to said common circuit conductor comprising projecting portions of selected ones of said eyelets associated with contact areas connected to said common circuit conductor, said eyelet-projecting portions being in contact with said planar shield, and each of said crimped projecting ends of the eyelets associated with said contact areas connectable to the second terminal of said tab connector being bent over toward the surface of said circuit board to prevent contact between the eyelet and planar shield.

4,200,902

PHOTOGRAPHY LIGHT

Charles Intrator, 225 Fifth Ave., Venice, Calif. 90291

Filed Nov. 16, 1978, Ser. No. 961,211
Int. Cl.[2] G03B *15/02*
U.S. Cl. 362—17 **19 Claims**



1. An illuminating device comprising a housing; a high temperature lamp, suitable for color photography, mounted at the forward part of the housing; a reflector, forward of the lamp, to reflect its light toward the back of the housing; a plurality of sets of strips of different light reflectivity at the rear of the housing and situated to receive the light from the reflector; one set of said strips having a reflective diffusive white exposed outer surfaces for reflecting light towards said forward part of the housing and the other set having a non-reflective dull black exposed outer surface, the leaves of one set being positioned between, and alternating with, the strips of the other set; the sets being mounted for relative sliding movement so that the strips of one set progressively cover and obscure those of the other set and thus progressively vary the amount of light reflected forward by the device; and means for effecting said sliding movement, said device being constructed to illuminate by the light emanating from the forward part of the housing.

4,200,903

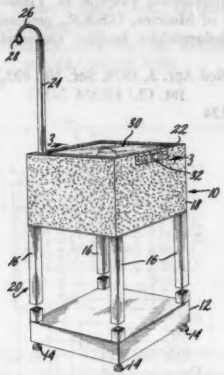
COMPACT PORTABLE INDIRECT LIGHTING FIXTURE WITH ACOUSTICAL CONTROL

Thomas A. Koenig, Stillwater, and Roger Benasutti, St. Paul, both of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Nov. 1, 1977, Ser. No. 847,535
Int. Cl.[2] A47B *97/00*
U.S. Cl. 362—134 **5 Claims**

1. A free-standing direct lighting fixture comprising:
(a) a frame;
(b) said frame being adapted to free standing on a generally horizontal surface;
(c) a lamp enclosure on said frame;
(d) an upward-directed reflector in said lamp enclosure;
(e) a high-intensity discharge lamp mounted horizontally in said lamp enclosure above said reflector and disposed diagonally to said frame;
(f) a frosted glass diffusing plate over said lamp and reflector;
(g) a ballast for said lamp within said enclosure; and

(h) sound absorbing material on the exterior of said enclosure capable of muffling sound generated internally in said



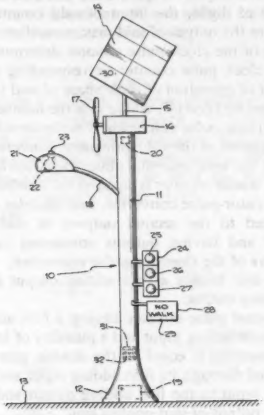
enclosure while simultaneously absorbing sound exterior to said enclosure.

4,200,904

SOLAR POWERED STREET LIGHTING SYSTEM

Duc Doan, 7814 S. San Pedro St., Los Angeles, Calif. 90003

Filed Apr. 14, 1978, Ser. No. 896,341
Int. Cl.² F21G *11/00*
U.S. Cl. 362—183 **5 Claims**



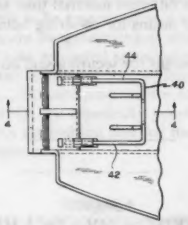
1. A totally independent street light system comprising:
an upright pole adapted to be mounted on a supporting surface;
a dry storage battery;
a plurality of solar panels coupled to said battery, each of said panels having a plurality of solar cells connected in series for providing a predetermined voltage to said battery, each of said panels connected in parallel to provide a predetermined amperage to said battery, all of said panels being mounted in a single unitary assembly on said pole;
a street light mounted on said pole electrically coupled to said battery and actuated by said battery;
wind driven alternator means mounted on said pole coupled to said battery for providing capacity to said battery augmenting said solar panels; and
a light actuated photocell coupled to said light for selectively lighting said light dependent upon light conditions at said pole.

4,200,905

DETACHABLE HINGE MECHANISM FOR LUMINAIRE

Billy L. Shelby, and William C. Moore, both of Memphis, Tenn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 5, 1977, Ser. No. 839,431
Int. Cl.² F21V *23/04*
U.S. Cl. 362—396 **8 Claims**



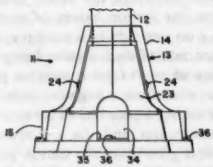
5. A hinge assembly for a luminaire in which a lens housing is pivotal relative to the main housing to enable access to the luminaire interior and to enable removal of said lens housing by disassociating the members of said hinge assembly, said hinge assembly comprising a channel affixed to one housing, a hinge pin affixed to the other housing and normally resting in said channel, and a hinge retainer for maintaining the association of said pin in said channel, said retainer comprising a rigid projection extending across the opening of said channel to capture said hinge pin in said channel in a manner allowing pivoting of the hinge pin and its housing in the channel relative to its housing, means in said one housing forming a bore for constraining said projection to translatory movement between a first position maintaining the capture of the hinge pin in said channel and a second position enabling release of the hinge pin from said channel to allow removal of said other housing, further means on said one housing providing limit stops for the translatory movement in both said positions, and a grasping handle adjacent the end of said projection remote from said channel to allow manual grasping of said projection to move said projection between said positions.

4,200,906

LIGHTING STANDARD SUPPORT

Alexander J. Santilli, Lakeside Ave., 393C, Lakeville, Mass. 02346

Filed Nov. 18, 1977, Ser. No. 852,715
Int. Cl.² F21S *1/10, 3/10, 13/10*
U.S. Cl. 362—431 **8 Claims**



1. A pole support comprising:
a cast housing defining a base portion for mounting on a support surface; a cavity for accommodating electrical gear; a pedestal portion with a lower portion defining a plurality of recesses and extending from said base portion

in the form of a truncated pyramid, the vertex of which defines a receiver opening for receiving a pole and communicating with said cavity; an access opening for allowing physical access to said cavity; and a plurality of externally located holes for receiving bolts that secure said base portion to the support surface and are physically accessible externally of said cavity, each of said holes located in a different one of said recesses;

a removable door means covering said access opening;

door securing means for securing said door means to said housing;

an annular threaded insert cast in said receiver opening and formed from a different material than said housing;

removable cover means for covering bolts disposed in said holes; and

cover securing means for securing said cover means to said housing.

4,200,907

METHOD OF TAKING A POLE OF A HIGH-VOLTAGE D-C TRANSMISSION STATION OUT OF SERVICE

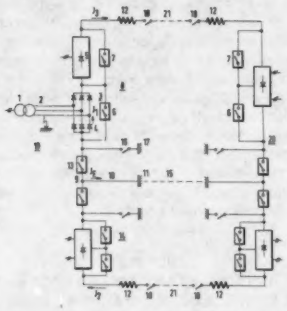
Michael Häusler, and Kadry Sadek, both of Hirschberg, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,245

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712232

Int. Cl.[2] **H02M** *5/40*

U.S. Cl. 363—35 **2 Claims**



1. Method of taking a pole of a high-voltage d-c transmission system (HVDCTS) out of service, having a rectifier station connected to a first three-phase network and an inverter station connected to a second three-phase network, two d-c lines connected from one station to the other, each station being divided into halves, the station halves of each station being connected together on one side to a station center grounding electrode, the other side of each station being connectible to the positive d-c line so as to form a positive pole, and to the negative d-c line so as to form a negative pole, and a residual-current switch for taking a pole out of service being disposed between the station center and the respective station half, which comprises first grounding the station pole by closing a pole grounding switch which is spaced from the station center grounding electrode and is connected to the connection of the residual-current switch to the station pole, and subsequently commutating a partial fault current of other poles, occurring from the pole being taken out of service, into the station center grounding electrode by opening the residual-current switch in the form of a three-phase power circuit breaker.

4,200,908

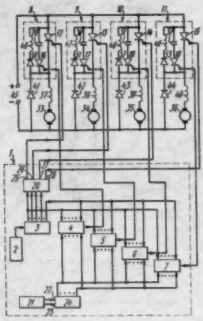
DEVICE FOR DIGITAL CONTROL OF POLYPHASE THYRISTOR-PULSE CONVERTER

Anatoly Y. Kalinichenko; Valentin M. Vlasov, and Grigory E. Kiksman, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia, Moscow, U.S.S.R.

Filed Apr. 3, 1978, Ser. No. 892,790

Int. Cl.[2] **H02M** *7/515*

U.S. Cl. 363—124 **1 Claim**



1. A device for digital control of a polyphase thyristor-pulse convertor consisting of several phases, including power thyristors, comprising:

a master oscillator having an output;

a clock pulse counter having an input, first logical outputs and second logical outputs whose number is equal to the number of digits, the input of said counter being connected to the output of said master oscillator; said second outputs of the clock pulse counter determining the states of said clock pulse counter corresponding to the shift of the start of operation of each phase of said thyristor-pulse convertor by (1/m) T, where m is the number of phases of said thyristor-pulse convertor, T is the switching period of the thyristors of the thyristor-pulse converter;

a decoder for time-constant pulse trains having inputs and outputs whose number is equal to the number of phases of said thyristor-pulse convertor, said decoder having inputs connected to the second outputs of said clock pulse counter and having outputs connected to said power thyristors of the thyristor-pulse converter;

a control unit having a first adding output and a second subtracting output;

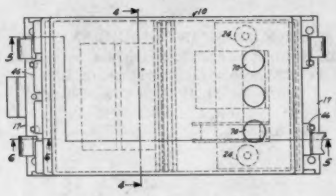
a bidirectional pulse counter having a first adding input, a second subtracting input and a plurality of logical outputs whose number is equal to the double number of digits connected through its first adding input and second subtracting input to the first adding output and second subtracting output of said control unit;

decoders for time-shifted pulse trains whose number is equal to the number of phases of said thyristor-pulse convertor; each of said decoders for time-shifted pulse trains having first inputs, second inputs and an output, connected through its first inputs to the first and second logical outputs of said clock pulse counter, connected through its second inputs to the logical outputs of said bidirectional pulse counter, and connected through its output to the other power thyristors of said thyristor-pulse converter; each of said decoders for time-shifted pulse trains includes dual diode matrices determining the shift of the time-shifted pulse trains (1/m) T, whose inputs form the first inputs of each of said decoders for time-shifted pulse trains and includes diode matrices determining the identical states of said bidirectional pulse counter whose inputs form the second inputs of each of said decoders for time-shifted pulse trains.

4,200,909
HIGH VOLTAGE POWER SUPPLY FOR ELECTROSTATIC AIR CLEANER

Jimmy L. Milum, Boone County, Ark., assignor to Emerson Electric Co., Saint Louis, Mo.

Filed Aug. 21, 1978, Ser. No. 935,353
Int. Cl.[2] H02M 7/00
U.S. Cl. 363—144 8 Claims

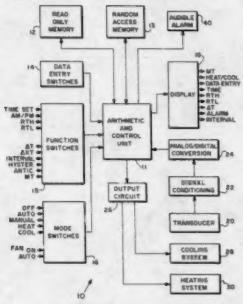


1. A high voltage power supply device for electrostatic air cleaners comprising a rectangular casing formed as a molding of dielectric material and having a top wall, two side walls, two end walls and a detachable cover member of conductive metal forming a bottom wall, a conveniently removable mounting board of dielectric material positioned in said casing so as to form a dividing wall dividing said casing into two compartments, a voltage step up transformer detachably connected to a wall of said casing and positioned in one of said compartments, electrical components including a pair of diodes and a pair of capacitors for converting the output of said transformer to a D.C. output of higher voltage mounted on said mounting board and positioned in the other of said compartments, and terminals mounted in a wall of said casing for connection of interior and exterior leads.

4,200,910
PROGRAMMABLE TIME VARYING CONTROL SYSTEM AND METHOD

Burness C. Hall, P.O. Box 1283, Dickinson, Tex. 77539

Continuation-in-part of Ser. No. 774,393, Mar. 4, 1977, Pat. No. 4,071,745. This application Jan. 30, 1978, Ser. No. 873,093
Int. Cl.[2] G05D 23/32
U.S. Cl. 364—104 37 Claims



1. A system for controlling a measured temperature during a sequence of time intervals in accordance with a sequence of selected reference temperatures, each corresponding to one of the intervals, comprising:

means for storing a plurality of digital numbers, each representing a value of one of the reference temperatures;

means connectable to respond to a reference frequency source for repeatedly generating a digital number representative, at each generation, of the present time of day;

means for storing a digital number representative of a value of hysteresis;

updating means for repeatedly determining, from said time of day number, when one of said intervals embraces the present time and identifying the one of said reference temperatures corresponding to said embracing interval and for storing, as a current reference temperature value, a digital number representing the value of said identified reference temperature, said updating means including means for determining that as soon as said present time exceeds the last interval in said sequence, said time becomes embraced by the first interval in the sequence;

means for displaying selected ones of said digital numbers;

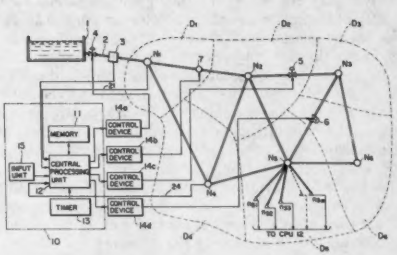
means connectable to be responsive to a sensor of said measured temperature for generating an electrical signal representation of said measured temperatures; and

comparison means responsive to said signal representation, to the current reference temperature number, and to the hysteresis number, for repeatedly generating control signals suitable for controlling thermal means affecting said measured temperature.

4,200,911
CONTROL OF THE FLOW RATE AND FLUID PRESSURE IN A PIPELINE NETWORK FOR OPTIMUM DISTRIBUTION OF THE FLUID TO CONSUMERS

Kuniaki Matsumoto, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 20, 1977, Ser. No. 844,123
Claims priority, application Japan, Oct. 20, 1976, 51-124981
Int. Cl.[2] G06F 15/20; G05B 13/02, 7/06
U.S. Cl. 364—105 14 Claims



2. In an interconnected multinode distribution network, wherein prescribed physical phenomena are supplied to the users thereof located in a plurality of areas, each of which areas is served by a respective node of said multinode distribution network, said system including a central control unit having data inputs coupled to said nodes and to the locations of the users of said phenomena for receiving prescribed data representative of the consumption of said phenomena, and having a plurality of outputs coupled to distribution control units, disposed within said network, for controlling the delivery of said phenomena through said network to said users, said central control unit including a central processor unit and associated memory for processing data coupled thereto and generating, in accordance with the processing of the data, control signals to be supplied to said distribution control units, a method controlling the distribution of said physical phenomena to said users comprising the steps of:

(a) measuring the user consumption of said phenomena at selected nodes and supplying data representative thereof to said central control unit;

(b) generating and storing, in said central control unit, a set of respective normalized patterns of consumption of said physical phenomena in accordance with the data measured in step (a);

(c) generating and storing in said central control unit a plurality of normalized user demand patterns associated

with each of the nodes of said network in accordance with prescribed user characteristics associated with each node;

(d) measuring the consumption of said phenomena for each user served by the nodes of said network and supplying data representative thereof to said central control unit;

(e) generating and storing, in said central control unit, quantities representative of the total consumption of said physical phenomena over a prescribed interval of time for each node of said network in accordance with the data measured in step (d);

(f) assigning, for each node in said network, a respective one of the normalized patterns of consumption generated in step (b) in accordance with a prescribed relationship between the normalized user demand pattern associated with said each node and the normalized user demand patterns associated with said selected nodes;

(g) producing, for each node of said network, a respective predicted user consumption demand pattern in accordance with the total consumption quantities generated in step (e) and the normalized patterns of consumption assigned to each node in step (f); and

(h) generating control signals and supplying said control signals from said central control unit to said distribution control units to thereby control the distribution of said physical phenomena over said interconnected multinode distribution network in accordance with the predicted user consumption demand patterns produced in step (g).

9. In an interconnected multinode distribution network, wherein prescribed physical pehnomena are supplied to the users thereof located in a plurality of areas, each of which areas is served by a respective node of said multinode distribution network, said system including a central control unit having data inputs coupled to said nodes and to the locations of the users of said phenomena for receiving prescribed data representative of the consumption of said phenomena, and having a plurality of outputs coupled to distribution control units, disposed within said network, for controlling the delivery of said phenomena through said network to said users, said central control unit including a central processor unit and associated memory for processing data coupled thereto and generating in accordance with the processing of the data, control signals to be supplied to said distribution control units, a system controlling the distribution of said physical phenomena to said users comprising, in combination:

first means for measuring the user consumption of said phenomena at selected nodes and supplying data representative thereof to said central control unit;

second means for measuring the consumption of said phenomena for each user served by the nodes of said network and supplying data representative thereof to said central control unit; and

wherein, within said control unit, said central processor unit and its associated memory respectively generate and store

a set of respective normalized patterns of consumption of said physical phenomena in accordance with the data measured and supplied by said first means,

a plurality of normalized user demand patterns associated with each of the nodes of said network in accordance with prescribed user characteristics associated with each node, and

quantities representative of the total consumption of said physical phenomena over a prescribed interval of time for each node of said network in accordance with the data measured and supplied by said second means, and wherein

said central processor unit assigns, for each node in said network, a respective one of the normalized patterns of consumption generated in accordance with a prescribed relationship between the normalized user demand pattern associated with said each node and the normalized user demand patterns associated with said selected nodes, produces, for each node of said network, a respective predicted user consumption demand pattern in accordance with the total consumption quantities and the normalized patterns of consumption assigned to each node, and generates control signals in accordance with the

predicted user consumption demand patterns; and wherein said control signals are supplied from said central processor unit to said distribution control units to thereby control the distribution of said physical phenomena over said interconnected multinode distribution network.

4,200,912

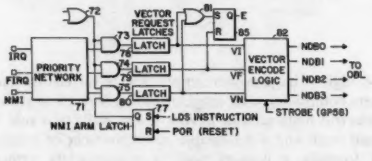
PROCESSOR INTERRUPT SYSTEM

Wayne D. Harrington, and Fuad H. Musa, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1978, Ser. No. 929,636

Int. Cl.[2] **G06F** *9/18*

U.S. Cl. 364—200 **9 Claims**



1. An interrupt system for a digital processor, comprising: a first input for receiving a first interrupt request; a second input for receiving a second interrupt request; a third input for receiving a third interrupt request; a priority network coupled to the first, second, and third inputs for establishing priority between the first, second, and third interrupt requests; first, second, and third latches coupled to the priority network for latching vector requests for each of the respective interrupt requests; and vector encode logic coupled to the first, second, and third latches for encoding an interrupt vector for an appropriate one of the first, second, or third interrupt requests.

4,200,913

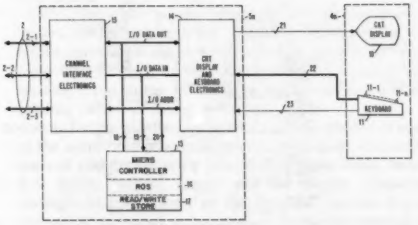
OPERATOR CONTROLLED PROGRAMMABLE KEYBOARD APPARATUS

Eugene Kuhar, and Donald L. Smith, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,401

Int. Cl.[2] **G06F** *15/02, 3/14*

U.S. Cl. 364—900 **9 Claims**



1. In a system including a visual display, a keyboard having a plurality of manually operable keys, a store for holding program instructions and for holding in tables therein data which is used in assigning original and redefined functions to each of the keys, and program-controlled processing apparatus for executing original key functions including the displaying of information on the display in accordance with data entered into the apparatus by the keys, the combination therewith of:

manually operable key redefinition means,

means responsive to the actuation of the key redefinition

means for changing the apparatus from an execution mode to a key redefinition mode,

means responsive to the depression of a first depressed key while the apparatus is in the key redefinition mode for modifying the store tables to save the original function assignment of the first depressed key, whereby the original function of the first depressed key is available for assignment as one or more of a list of functions to be assigned to the first depressed key,

means responsive to the depression of each additional key thereafter depressed while the apparatus is in the key redefinition mode for modifying the state of a redefine function table corresponding to the first depressed key to accumulate the function of each said additional key in a stored sequential list of functions to be executed when said first depressed key is operated in its redefined mode, and

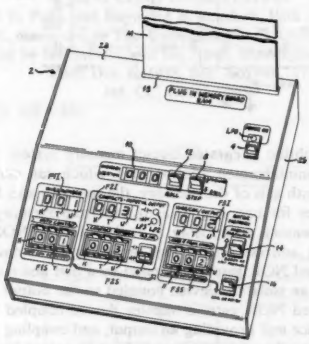
means responsive to a second actuation of the key redefinition means for returning the apparatus to the execution mode.

4,200,914

MEMORY PROGRAMMING CONTROL SYSTEM FOR STORING A WIRE NUMBER PROGRAM OF A LADDER DIAGRAM FOR A PROGRAMMABLE CONTROLLER

Paul M. Kintner, Bayside, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 22, 1977, Ser. No. 853,879
Int. Cl.[2] G06F *15/46, 9/16*
U.S. Cl. 364—900 **18 Claims**



1. A programmer for wire number programming of the elements of a plural-rung ladder diagram in random order, said rungs having any desired numbers and combinations of control elements such as input devices and series and/or parallel contacts, and each rung terminating in a controlled element such as a control coil or output device comprising:

a read-write memory having a plurality of data word set storage locations;

encoding means operable to encode a wire number program for said plurality of rungs of the ladder diagram comprising a first data word set comprising the input wire number to a first element, the first element number, and the output wire number from the first element when said first element is either a series element or the last one of a group of parallel elements or no output wire number when said first element is other than the last one of a group of two or more parallel elements;

said encoding means being further operable following entry of said first data word set in said memory to encode a second data word set comprising the input wire number to a second element that is the same as said output wire number from the first element when said first element is either a series element or the last programmed one of a group of parallel elements or is the same as said input wire number to said first element when said first and second elements are parallel elements, the second element number, and the output wire number from the second element when said second element is either a series element or the last one of a group of parallel elements or no output wire number when said second element is other than the last programmed one of a group of two or more parallel elements or a controlled element;

said encoding means being further operable to encode similarly three-data-word sets for any desired number of series elements and the last one of a group of parallel elements or two-data-word sets for any desired number of additional elements that are other than the last programmed one of a group of parallel elements or controlled elements;

said programming being subject to the requirement that the programming may be random as to the data word sets in different rungs with the limitation that the programming of each rung must be unidirectional and progressive toward its controlled element with respect to the data word sets of series elements and groups of parallel elements but need not be successive with respect to the data word sets of any given rung;

selectively-operable entry control means;

and logic circuit means responsive to selective operation of said entry control means following each said encoding of a data word set for storing the respective data word set in a predetermined plural data word location in said memory with the plural data word locations for the successively encoded data word sets being in advancing relation in said memory;

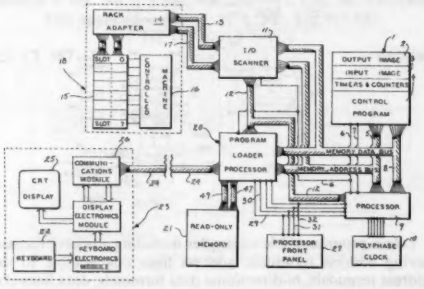
and special code generating means comprising first code generating means for generating a first code indicative of an OR-logic instruction whenever any control element but the last one of a plurality of parallel control elements is stored in the memory.

4,200,915

PROGRAM LOADER FOR PROGRAMMABLE CONTROLLER

Odo J. Struger, Chagrin Falls; Valdis Grants, Lyndhurst, and Raymond A. Grudowski, South Euclid, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Apr. 5, 1978, Ser. No. 893,252
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—900 **11 Claims**



1. In a programmable controller having a memory which stores a control program comprised of a set of controller instructions, having a controller processor which is operable to sequentially read controller instructions out of said memory and execute them, and having an I/O interface rack which couples to said controller processor and which interfaces it with sensing devices and operating devices on a controlled machine, the improvement therein comprising:

a mode switch associated with the controller processor which has a plurality of manually selectable positions and associated output terminals, said mode switch being oper-

able to generate a logic signal at the output terminal associated with the selected position, said logic signal determines in which of a plurality of possible modes of operation the programmable controller is to operate;

a set of mode control lines, each connected to respective ones of said mode switch output terminals and coupled to said controller processor to effect its mode of operation; and

a program loader connected to said mode control lines and coupled to said controller memory to read controller instructions out of said memory and to write controller instructions into said memory, said program loader including:

manual data entry means for entering commands into the program loader from a location remote from said controller processor,

means for determining the presence of a logic signal on each of said control lines, and

means responsive to the presence of a logic signal on a selected one of said control lines and selected commands entered through said data entry means for generating a logic signal on another one of said mode control lines and to thereby select in which of said plurality of possible modes of operation the programmable controller is to operate.

4,200,916

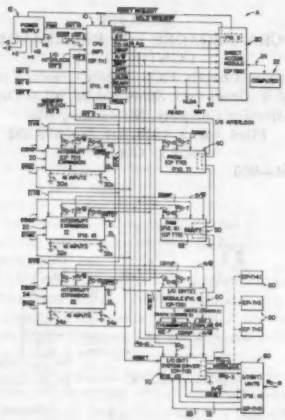
PROGRAMMABLE CONTROLLER USING MICROPROCESSOR

William H. Seipp, Bettendorf, Iowa, assignor to Gulf & Western Industries, Inc., New York, N.Y.

Division of Ser. No. 701,858, Jul. 1, 1976, Pat. No. 4,107,785. This application Jun. 12, 1978, Ser. No. 914,807

Int. Cl.[2] G05B *11/01*

U.S. Cl. 364—900 **6 Claims**



1. In a programmable controller including a microprocessor having address terminals, address lines connectable to said address terminals, bi-directional data terminals, data lines connectable to said data terminals, and an actuatable means for shifting said microprocessor when actuated by an interrupt initiating signal from a program sequence being processed to a selected subroutine program at a selected memory location addressed by a selected coded memory address received on said data lines; a plurality of interrupt request devices for creating any one of several interrupt requesting signals and interrupt means responsive to each of said requesting signals for creating an interrupt initiating signal for said actuatable means, the improvement comprising: an interrupt expansion module including a memory means for storing a number of separate and distinct coded memory addresses each corresponding to a given one of several external interrupt request inputs connected to said module; external interrupt means responsive to actuation of any one of said several external interrupt request inputs for energizing a selected one of said interrupt request devices whereby said actuatable means is actuated; and, said external interrupt means also responsive to actuation of a selected one of said several external interrupt request inputs for directing the coded memory address corresponding to said selected one of said several external interrupt requests from said memory means on said module through connecting lines to said bi-directional data lines whereby the subroutine program at said directed coded memory address is used to control the operation of said controller.

4,200,917

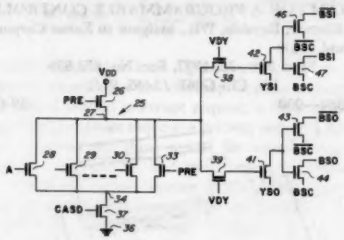
QUIET COLUMN DECODER

Jerry D. Moench, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 12, 1979, Ser. No. 19,990

Int. Cl.[2] G11C *11/40, 13/00*

U.S. Cl. 365—208 **9 Claims**



1. A monolithic integrated circuit memory system having continuous uninterrupted address lines which can carry addresses for both axis of the memory, the memory also having bit sense lines for carrying data to and from memory cells within the memory, comprising: a double clocked NOR gate for decoding address signals and providing an output, the double clocked NOR gate being gated by a first and a second clock signal; an isolation device coupled to the output of the double clocked NOR gate; a transfer device coupled to the isolation device and providing an output; and coupling means for coupling predetermined bit sense lines to output lines, the coupling means being coupled to the transfer device so that the transfer device can control the coupling means.

4,200,918

CONTROL CIRCUIT FOR THE ADAPTATION OF STORAGE CELLS IN BIPOLAR INTEGRATED CIRCUITS

Hans Glock, Odelzhausen-Höfa, and Gerhard Hartel, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,020

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1977, 2738187

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—210 **6 Claims**

1. A bipolar memory integrated circuit, comprising:

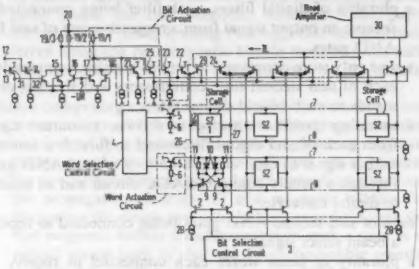
(a) a plurality of storage cells addressable by bit and word lines;

(b) a write-read control circuit means for changing information content of the storage cells via the bit lines;

(c) a reference potential and a cell operating potential derived from the reference potential;

(d) each storage cell having a current-voltage characteristic curve and an operating point thereon controlled by the cell operating potential; and

(e) reference potential control circuit means having a simulation storage cell substantially identical in construction to and having all the components of the other storage cells, said reference potential control circuit means regulating



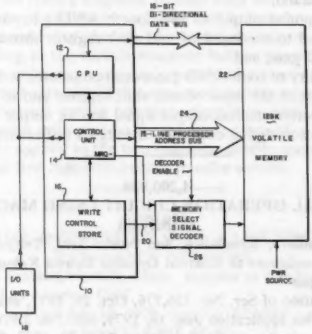
the storage cells via the reference potential such that a cell current passing through a storage cell when the storage cell is addressed is substantially independent of manufacturing related variations of the characteristic curve of the addressed storage cell.

4,200,919

APPARATUS FOR EXPANDING THE MEMORY OF A MINI-COMPUTER SYSTEM

Robert E. Page, and Raymond B. Brackett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 5, 1978, Ser. No. 966,717
Int. Cl.[2] G11C *13/00*
U.S. Cl. 365—230 **10 Claims**



1. Apparatus for storing and accessing information to be used by a data processing system which employs a minicomputer having an address bus and a data bus, said minicomputer being capable of addressing a specific maximum number of discrete storage cells, said apparatus comprising:

memory module means comprising a number of discrete information storage cells which exceeds said specified maximum number, said memory module means being divided into a plurality of memory sections, each of said memory sections comprising a selected number of said discrete information storage cells, the number of discrete storage cells in one of said memory sections not exceeding said specified maximum number;

means included in said minicomputer for generating a plurality of memory select signals, each of said memory select signals uniquely corresponding to one of said memory sections; and

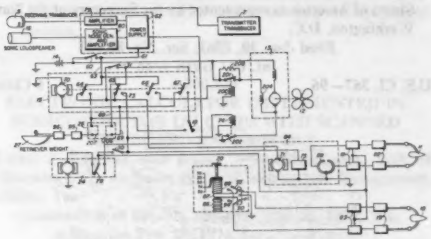
according means responsive to each of said memory select signals for coupling the data bus and the address bus of said minicomputer to a given one of said memory sections when the memory select signal corresponding to said given memory section has been generated.

4,200,920

ARTIFICIAL UNDERWATER TARGET

David J. Evans, and Clark F. Bradley, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 656,104, Mar. 21, 1946. This application Feb. 29, 1956, Ser. No. 573,577
Int. Cl.[2] B63G *8/22*; H04K *3/00*
U.S. Cl. 367—1 **1 Claim**



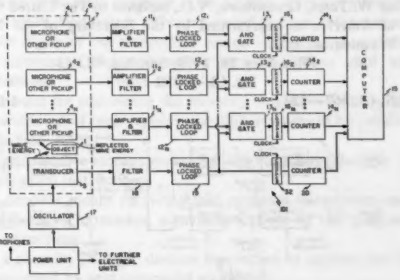
1. In combination in a free, underwater craft, a hull, means for carrying ballast, means for discharging said ballast, depth responsive means, a timer providing two time intervals, control means operated by said timer for actuating said discharging means after a pre-set time interval, and other control means operated by both said timer and said depth responsive means for actuating said discharge means after a shorter time interval if said craft attains a pre-set depth.

4,200,921

APPARATUS AND METHOD WHEREBY WAVE ENERGY IS CORRELATED WITH POSITIONAL RELATIONSHIPS IN A SYSTEM

Bruce S. Buckley, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 679,262, Apr. 22, 1976, Pat. No. 4,095,475. This application Jun. 1, 1978, Ser. No. 911,622
Int. Cl.[2] G01S *9/66*
U.S. Cl. 367—87 **5 Claims**



1. A method that employs geometrical characteristics of an object as a source of information with respect to the object, that comprises: directing wave energy of a single frequency upon the object which reflects the same; detecting the reflected wave energy; comparing a characteristic of the reflected wave energy with the same characteristic of the wave energy directed upon the object to note any difference θ_A

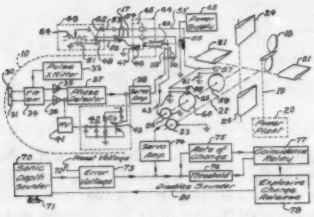
therebetween; and comparing the difference θ_A with a standard difference θ_B of the same characteristic to determine any differential θ_Δ therebetween, the differences θ_A and θ_B being indicative of relative positions between the object and a source of wave energy; said reflected wave energy being detected at a plurality of locations and said difference θ_A being developed as a plurality of differences θ_1', θ_2' . . . , said standard difference θ_B being a corresponding plurality of differences θ_1, θ_2 . . . , differential θ_Δ being developed for each corresponding pair to develop data comprising $\theta_1-\theta_1'$, $\theta_2-\theta_2'$ . . . , the data thus developed providing said information.

4,200,922

SELF-PROPELLED VEHICLE FOR DESTROYING GROUND MINES

Julius Hagemann, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 30, 1961, Ser. No. 85,935
Int. Cl.[2] G01S 9/66
U.S. Cl. 367—96 **6 Claims**



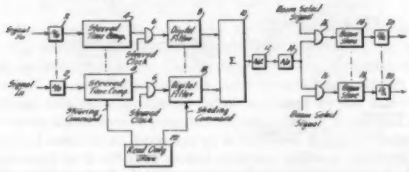
1. Apparatus for destroying a ground mine lying proud on the ocean floor comprising a self-propelled dirigible underwater vehicle carrying an explosive charge and having a catacoustic system for steering said vehicle in the azimuthal direction of a sound reflecting object, diving control surfaces carried by said vehicle, means for developing a control signal representative of the departure of the vehicle from a selected distance above the ocean floor, means responsive to said control signal for operating said diving control surfaces, and means responsive to a certain change in magnitude of said control signal within a selected time interval for releasing said explosive charge.

4,200,923

STEERED TIME COMPRESSOR BEAM FORMER

Fred W. Thies, Greensboro, N.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 28, 1970, Ser. No. 48,623
Int. Cl.[2] G01S 3/80
U.S. Cl. 367—123 **1 Claim**



1. In a sonar apparatus, the improvement comprising:

a geometrical array comprising a plurality of hydrophones,

a plurality of analog-to-digital converters, each converter connected to receive analog signals from a respective hydrophone,

a plurality of steered time compressors, each time compressor connected to receive a digital signal from a respective converter,

a plurality of first AND gates, each of said first AND gates being connected to receive a digital output signal from a respective compressor and a steered clock signal,

a plurality of digital filters, each filter being connected to receive an output signal from a respective one of said first AND gates,

a read only store connected to furnish steering commands to each of said steered time compressors and shading commands to each of said digital filters,

a summing circuit connected to receive an output signal from each of said digital filters and to furnish a summed output signal to each of a plurality of second AND gates through a serially connected AGC circuit and an analog-to-digital converter,

each of said second AND gates being connected to receive a beam select signal,

a plurality of beam stores each connected to receive an output signal from a respective second AND gate,

a plurality of digital-to-analog converters each connected to receive an output signal from a respective beam store,

means to form said steered clock signal comprising a plurality of third AND gates and a bit register,

each of said third AND gates being connected to receive an output signal from a respective output of said bit register and a respective fine steering command lead,

said bit register being connected to receive a clock frequency on an input terminal and a multiple of said clock frequency on a plurality of shift terminals,

said steered time compressor comprising,

a shift register made from three serially connected smaller registers each connected to receive a clock frequency on a plurality of shift terminals,

a plurality of fourth AND gates each connected to receive an output from said shift register and a coarse steering command,

a commoned output of said fourth AND gates being connected to the input of said shift register through a fifth AND gate, and

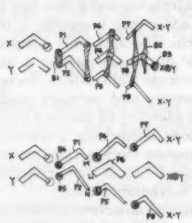
a plurality of sixth AND gates each connected to furnish an output to the input of said shift register and to receive a respective steered sample signal and an output from said analog-to-digital converter through a buffer store.

4,200,924

LOGICAL OPERATION CIRCUIT USING MAGNETIC BUBBLES

Hideo Ishihara, Kamakura, and Norio Seki, Tokyo, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation of Ser. No. 736,776, Oct. 29, 1977, abandoned. This application Jan. 16, 1979, Ser. No. 3,970
Claims priority, application Japan, Oct. 30, 1975, 50/130838
Int. Cl.[2] G11C 19/08
U.S. Cl. 365—5 **4 Claims**



1. In a logical operation circuit for performing a desired logical operation by transferring at least one magnetic bubble

on a plurality of magnetic bubble transfer paths employing chevron patterns, the improvement comprising:

means comprising a first magnetic bubble transfer section provided in two neighboring ones of the magnetic bubble transfer paths for stably holding a single magnetic bubble transferred along one of the two magnetic bubble transfer paths across the two magnetic bubble transfer paths therein and for stably holding two magnetic bubbles transferred along the two magnetic bubble transfer paths each on a respective one of the two magnetic bubble transfer paths;

means comprising a second magnetic bubble transfer section connected to said first magnetic bubble transfer section and formed by a section of the two neighboring magnetic bubble transfer paths having an enlarged space between the two neighboring magnetic bubble transfer paths along the propagation direction of said magnetic bubbles for elongating the single magnetic bubble passed through the first magnetic bubble transfer section in such a state as to extend across both of the two magnetic bubble transfer paths and for resting said two magnetic bubbles each on a respective one of the wider spaced two neighboring magnetic bubble transfer paths; and

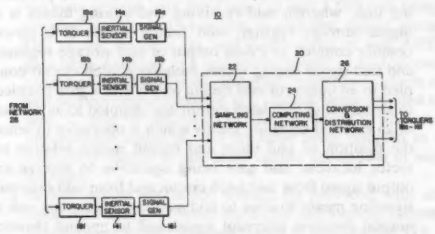
output terminal means comprised of three magnetic bubble transfer paths at the succeeding stage of said second magnetic bubble transfer section for coupling all of the three magnetic bubble transfer paths with said elongated magnetic bubble and positioned defining respective spaces between respective ends of the two magnetic bubble transfer paths of said second magnetic bubble transfer section and an end of the center one of the three magnetic bubble transfer paths which are sufficiently greater than respective spaces defined between the respective ends of the two magnetic bubble transfer paths of said second magnetic bubble transfer section and respective ends of the outer two of the three magnetic bubble transfer paths for transferring said elongated magnetic bubble to a center one of the three magnetic bubble transfer paths, and for coupling said two resting magnetic bubbles each with a respective end one of said three magnetic bubble transfer paths and for transferring the two magnetic therealong without coupling to the middle magnetic bubble transfer path to derive at least one magnetic bubble at at least one predetermined path of said three magnetic bubble transfer paths as a logical output corresponding to a desired logical operation with respect to the input state of a magnetic bubble applied to the two magnetic bubble transfer paths of said first magnetic bubble transfer section.

4,200,925

INERTIAL INSTRUMENT WITH A MULTIPLEXED REBALANCE NETWORK

Glenn F. Cushman, Norfolk, Mass., assignor to Northrop Corporation, Los Angeles, Calif.

Filed Jul. 10, 1978, Ser. No. 922,818
Int. Cl.[2] G06F *15/50*
U.S. Cl. 364—107 **10 Claims**



1. A multiple rebalance loop inertial instrument comprising:

an inertial sensor for each of said rebalance loops, each sensor having an associated means for generating a position signal and having an associated torquer means for applying a torque to said sensor in response to an applied torquer signal,

a rebalance network coupled to said inertial sensors, said network including:

A. sampling means for successively sampling said position signals and for generating a digital position signal comprising a succession of digital position words, wherein each digital position word in said succession is representative of the value of one of said position signals at the corresponding sample time,

B. computing means responsive to said succession of digital position signals to generate a corresponding succession of digital rebalance words,

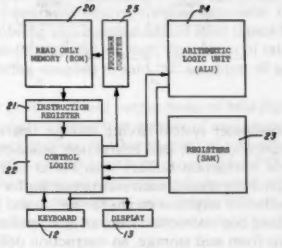
C. means for converting each of said digital rebalance words to a torquer signal and for applying that torquer signal to the torquer means of the corresponding inertial sensor.

4,200,926

ELECTRONIC CALCULATOR IMPLEMENTED IN SEMICONDUCTOR LSI CHIPS WITH SCANNED KEYBOARD AND DISPLAY

Michael J. Cochran, and Jerry L. Vandierendonck, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 255,856, May 22, 1972. This application Feb. 20, 1974, Ser. No. 444,226
Int. Cl.[2] G06F *3/02, 7/48*
U.S. Cl. 364—200 **35 Claims**



1. An electronic calculator comprising:

(a) keyboard input means for entering data and functions;

(b) addressable memory means defining a plurality of data registers, and means for storing in specific addressed locations in the data registers in bit-parallel format a plurality of multi-digit words of binary coded decimal information, the digits of the multi-digit words remaining in specific locations of the addressable memory means until addressed;

(c) means for addressing the memory means for shifting the words out of each register one digit at a time in bit parallel fashion;

(d) addressable storage means for storing a large number of program instructions;

(e) decoder means receiving said program instructions and generating command signals according to the program instructions;

(f) a plurality of logic devices connected to receive and be operated by said command signals;

(g) bit parallel arithmetic logic means connected via the logic devices to the data registers for performing parallel arithmetic and logic operation on said multidigit coded words as shifted out one digit at a time, as commanded by the command signals, and for producing an output, for applying the resulting words from said output of the arithmetic logic means to said means for storing via the logic

devices whereby the resulting words are stored in specific addressed locations in one of the data registers;

(h) display output means connected to the storage means via the logic devices for displaying the resulting words as stored in said one of the data registers;

(i) timing means for producing timing signals for sequentially addressing corresponding digits of each of the data registers one digit at a time from least to most significant digit;

(j) means connected to receive a plurality of the timing signals addressing the data registers and producing therefrom encoded timing signals; and

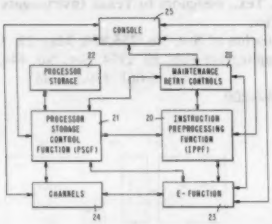
(k) means for generating scanning controls for the keyboard input means and the display output means in response to said encoded timing signals.

4,200,927

MULTI-INSTRUCTION STREAM BRANCH PROCESSING MECHANISM

Jeffrey F. Hughes, Ulster Park; John S. Liptay, Rhinebeck; James W. Rymarczyk, and Stanley E. Stone, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,686
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—200 **8 Claims**



1. In a computer system having storage, instruction processor, and execution unit, said instruction processor including a plurality of instruction buffers with buffer selection and instruction fetching means, each instruction buffer being responsive to said buffer selection means to receive and store, concurrently, at least one instruction from an independent sequence of instructions from said storage, an instruction decoder, instruction gate means interconnecting said instruction decoder and a selected one of said instruction buffers, and an instruction queue comprised of a plurality of queue registers, each said queue register storing execution control information received from said instruction decoder for each instruction decoded, said execution unit including control means, responsive to said execution control information received from each said queue register, for performing the function called for by each said instruction, and providing to said instruction processor, result signals for certain of said instructions, instruction sequencing logic comprising:

branch signalling means, responsive to a branch instruction in said instruction decoder received from a first one of said instruction buffers, for controlling said buffer selection and instruction fetching means to transfer a target instruction from said storage to another of said instruction buffers;

instruction gate control means connected to said instruction gate means, for transferring a next instruction to said instruction decoder after transfer of said execution control information of said branch instruction to said instruction queue;

target buffer indicating means responsive to said branch signalling means, associated with each of said queue registers when storing execution control information of a branch instruction, for indicating said another of said instruction buffer means; and

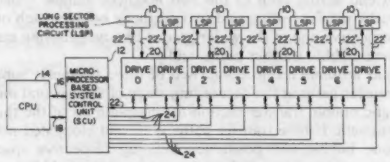
instruction selection means, responsive to said result signals from said execution unit in response to said branch instruction and said associated target buffer indicating means, for selecting the next sequential execution control information to be transferred to said execution unit.

4,200,928

METHOD AND APPARATUS FOR WEIGHTING THE PRIORITY OF ACCESS TO VARIABLE LENGTH DATA BLOCKS IN A MULTIPLE-DISK DRIVE DATA STORAGE SYSTEM HAVING AN AUXILIARY PROCESSING DEVICE

Isin D. Allan, Saratoga, and Per-Erik Walberg, San Jose, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 23, 1978, Ser. No. 871,283
Int. Cl.[2] G06F *13/04*
U.S. Cl. 364—200 **5 Claims**



1. In a system having an auxiliary processing unit for input and output control of data between a memory of a computer central processing unit and a plurality of data storage devices having digital data blocks which are arranged in serial format on a circular track and which are accessible to input and output means of said data storage devices only during limited time intervals, wherein selected ones of said data blocks have been assigned a priority value corresponding to an advance in the apparent initial location of each one of said data blocks in said circular track, a circuit associated with each one of said data storage devices for issuing an extended duration interrupt signal to said auxiliary processing unit for temporarily blocking access by other data storage devices to said central processing unit in connection with an advance of the apparent initial location of said selected data blocks, said circuit comprising:

means coupled to said auxiliary processing unit for receiving and storing said priority value;

means coupled to said receiving and storing means and to said auxiliary processing unit for converting said stored priority value to a signal having a duration corresponding to said priority value in response to a synchronizing signal from said auxiliary processing unit;

means coupled to said auxiliary processing unit for distinguishing between data blocks; and

means responsive to said duration signal of said priority value converting means and to said distinguishing means for issuing said extended duration interrupt signal during one of said limited time intervals to said auxiliary processing unit, wherein said receiving and storing means is a digital storage register; said timing means is a down counter coupled to a data output of said storage register; and said signal issuing means includes a latch circuit coupled to an output of said timing means and a gate coupled to an output of said latch circuit and coupled to an output of an external signaling means which is operative to sense the position of said input and output means relative to sector location, said gate being operative to receive an output signal from said latch circuit and from said external signaling means to issue to said auxiliary processing unit a normal duration interrupt signal and to append thereto said extended duration interrupt signal at the termination of said normal duration interrupt signal for temporarily blocking access by other data storage devices to said central processing unit and thereby to increase the likeli-

hood of access to said central processing unit memory of said selected ones of said data blocks which have been assigned a priority value.

4,200,929

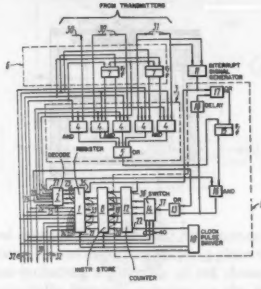
INPUT DEVICE FOR DELIVERY OF DATA FROM DIGITAL TRANSMITTERS

Alexandr D. Davidjuk, prospekt Voroshilova, 7a, kv. 18; Anatoly A. Koshevoi, Tverskoi Tupik, 9, kv. 62; Viktor J. Lapy, ulitsa Chekistov, 24, kv. 16, and Vasily N. Frankov, prospekt Voroshilova, 17a, kv. 141, all of Kiev, U.S.S.R.

Filed Jan. 23, 1978, Ser. No. 871,395

Int. Cl.[2] G06F *9/16*

U.S. Cl. 364—200 **1 Claim**



1. A digital input device having output buses for delivery of data from digital transmitters, comprising:

a register (1) provided with message inputs (33), a control input (21), a reset input (35), a first output group (23), and a second output group (24);

a decoder (2) provided with message inputs (23) coupled to said first output group of said register, a pulse input (25), a first separate output (26), a second separate output (27), a first output group (28), a second output group (29), and a third output group (34);

a transmitter state change acknowledgement signal generator (3) provided with an OR gate (5) and AND gates (4) whose number is equal to that of message outputs of said transmitters, said AND gates having their outputs coupled to the inputs of said OR gate;

a transmitter previous state storage incorporating storage cells in the form of flip-flops (7) provided with "1" and "0" set inputs, synchronization inputs, and outputs;

each of said AND gates of said transmitter state change acknowledgement signal generator being provided with a first, a second, a third and a fourth input, said first input (30, 31) of said AND gate being coupled to a respective message output of said transmitter, said second input of said AND gate being coupled to a respective output of said outputs of said flip-flop (7) of said transmitter previous state storage, said third input of said AND gate being coupled to a respective output of said first output group (28) of said decoder (2), said fourth input of said AND gate being coupled to a respective output of said second output group (24) of said register (1), respective outputs of said second output group of said register being coupled to said "1" and "0" set inputs of said flip-flops (7), said synchronization inputs of said flip-flops being coupled to a respective output of said third output group (34) of said decoder;

a random access instruction storage (8) provided with address inputs (19), a control input (20) and message outputs (33) coupled to said message inputs of said register (1);

a priority transmitter-operated interrupt signal generator (11) provided with inputs (31) coupled to message outputs of said transmitters, and an output;

a control unit (9) provided with a clock pulse driver (10), a first OR gate (13), a second OR gate (17), and AND gate (16), a counter (12), a switch (14), a static flip-flop (15), and a delay circuit (18);

said counter provided with "1" set inputs (from 14), a counting input (22), a reset input (36), and outputs coupled to said address inputs of said random access instruction storage;

said clock pulse driver provided with a first output coupled to said control inputs of said register (21) and said random access instruction storage (20), a second output (25) coupled to said pulse input of said decoder (2), and a third output (22) coupled to said counting input of said counter (12);

said switch (14) provided with an enabling input (37), message inputs (40), and outputs coupled to said "1" set inputs of said counter;

said first OR gate (13) of said control unit, provided with a first input, a second input (26) coupled to said first separate output of said decoder, and an output coupled to said enabling input (37) of said switch;

said AND gate (16) of said control unit, provided with a first input, a second input coupled to said second separate output (27) of said decoder, and an output coupled to said first input of said first OR gate (13) of said control unit and to the input of said delay circuit (18);

said static flip-flop (15) provided with an "0" set input, a "1" set input coupled to the output of said OR gate (5) of said transmitter state change acknowledgement signal generator, and an output coupled to said first input of said AND gate (16) of said control unit;

said second OR gate (17) of said control unit, provided with a first input coupled to the output of said delay circuit (18), a second input coupled to said output of said priority transmitter-operated interrupt signal generator (11), said last output being also coupled to said reset inputs (36), (35) of said counter and said register, the output of said second OR gate being coupled to said "0" set input of said static flip-flop;

wherein, a first portion of said output buses of said digital input device are coupled to respective outputs of said second output group (24) of said register, another portion of said output buses (32) being coupled to said fourth inputs of said AND gates (4) of said transmitter state change acknowledgement signal generator (3), and a separate one of said output buses being coupled to a respective output of said second output group (29) of said decoder (2).

4,200,930

ADAPTER CLUSTER MODULE FOR DATA COMMUNICATIONS SUBSYSTEM

Robert L. Rawlings, El Toro, and Ronald D. Mathews, Mission Viejo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 799,265, May 23, 1977, abandoned. This application Aug. 10, 1978, Ser. No. 932,698

Int. Cl.[2] G06F *3/04*

U.S. Cl. 364—200 **16 Claims**

1. In a data communications network having a plurality of peripheral terminals connected via transmission lines to a central station, wherein said central station includes a main host system having a host processor and main memory, said main host system connecting to a data communications subsystem dedicated to the handling of data transfer operations, said data communications subsystem including a data communications processor, a local autonomous data communications memory and a plurality of front-end controllers including an improved adapter cluster module front-end controller-processor which connects to a plurality of remote peripheral terminals via line adapters, an improved data communications subsystem including said improved adapter cluster module comprising:

(a) a data communications processor connected to said main host system for providing pointer addresses and instructions to be accessed by each of said front-end controllers

associated with the data communications subsystem and wherein said data communications processor includes:

(a1) means to sense a halt or failure in said main host system and;

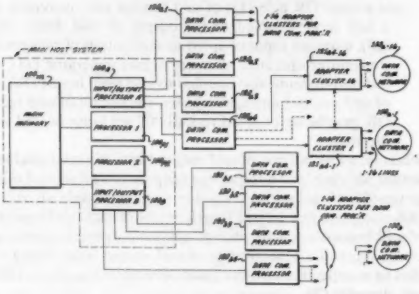
(a2) means to initiate continuous autonomous operation of said data communications subsystem independently of said main host system during any period when said main host system is inoperative;

(b) a plurality of specialized front-end controllers for executing data transfer operations for different speed and line disciplines of transmission lines to peripheral terminals, each of said front-end controllers capable of accessing instructions from addresses in main memory or addresses inlocal autonomous data communications memory, said addresses being provided by said data communications processor;

(c) a basic control interface providing control and communication exchange between: said data communications processor, said local autonomous data communications memory and said front-end controllers;

(d) a local autonomously operating data communications memory directly accessible to said data communications processor and each of said front-end controllers;

(e) a command block in local data communications memory for providing instructions, control and information data for each individual front-end controller;



(f) an improved adapter cluster module front-end controller-processor including:

(f1) a plurality of line adapters each one of which is connected via transmission lines to a separate remote peripheral terminal, said line adapters being controlled by a central control means;

(f2) a central control means including:

(f2a) ROM memory means for storing data transfer program routines;

(f2b) RAM memory means for temporary storage of data received from remote peripheral terminals or for temporary storage of data ready for transmittal to said remote peripheral terminals, said RAM memory including dedicated storage areas for each specific line adapter connected to a remote terminal, said RAM memory also including memory space for temporary storage of specialized routines as directed by said data communications processor;

(f2c) processing means for processing instructions fetched from said ROM and/or said RAM memory means;

(f2d) a plurality of working registers for the storage of addresses, instructions and data which is to be transmitted and/or processed either to/from said remote peripheral terminals or to/from said data communications memory.

4,200,931

SIGNAL PROCESSING SYSTEM

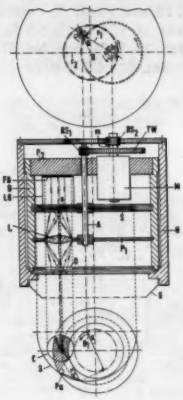
Simon Duinker, Bloemendaal, Netherlands, assignor to N.V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Aug. 30, 1977, Ser. No. 829,055

Claims priority, application Netherlands, Sep. 8, 1976, 7609963

Int. Cl.[2] G01N *21/00*

U.S. Cl. 364—414 **6 Claims**



1. A signal processing system for use in an analog tomographic system in which successive primary absorption profile signals are produced from a flat diverging beam of penetrating radiation directed through at least one half of a cross-sectional slice of a subject during corresponding successive relative angular positions between the subject and an assembly including detector means and a source for the beam of penetrating radiation, said system comprising

memory and display means having an annular region disposed about a memory center for storing and displaying a succession of primary signal profiles corresponding to said successive primary absorption profile signals, said memory and display means storing and displaying said primary signal profiles along segments of corresponding primary trajectories extending radially from the memory center and crossing the annular region, said primary trajectory segments being circular arcs generated about successive primary trajectory centers which are positioned in a primary trajectory circle concentric with the annular region,

a rotatable optical filter having an axis of rotation and at least one spacial filtering region spaced from the axis of rotation,

rotating and orbiting means mounting said optical filter over said memory display means for orbiting the axis of rotation of the optical filter in a secondary trajectory circle concentric with the memory center and for rotating the optical filter about its axis of rotation to sweep said spacial filtering region through secondary trajectory segments across the annular region to transmit successive series of fragments of corresponding successive series of primary signal profiles through the spacial filtering region,

said optical filter and said rotating and orbiting means being designed so that said transmitted fragments of primary signal profiles in each series correspond to parallel portions of a series of the diverging beams of penetrating radiation from which the corresponding series of primary signal profiles was generated, and

a detector device responsive to the transmitted fragments of primary signal profiles for generating successive secondary profile signals.

4,200,932

MEANS FOR THE CONTROL AND REGULATION OF THE PRINTING PROCESS ON PRINTING PRESSES

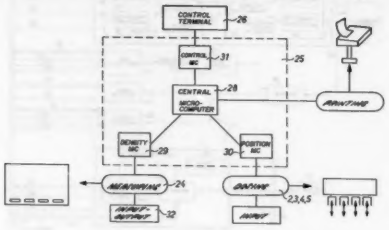
Peter Schramm, Kahl am Main; Siegfried Schuhmann, Offenbach am Main; Edgar F. Schöneberger, Seligenstadt; Alfred Dorn, and Bert Cappel, both of Mühlheim, all of Fed. Rep. of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,800

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1977, 2728738

Int. Cl.[2] **B41J** *33/00*

U.S. Cl. 364—519 **4 Claims**



1. An ink feed control for a printing machine comprising:

means for dosing the ink feed to a printing plate of the printing machine including a plurality of ink dosing elements disposed generally laterally relative to the direction of movement of material being printed;

controlled adjustment means for individually adjusting the positions of the ink dosing elements and for producing current position values for the elements;

an ink density measuring device remote from the printing machine operable to scan a plurality of control fields on the printed material after a printing operation, the control fields being disposed generally laterally relative to the direction of movement of material being printed, to produce actual density values for the control fields;

comparator means for comparing the actual ink density values with desired ink density values;

first microcomputer means for controlling the scanning of the ink density measuring device and for collecting the actual density values from the ink density measuring device and coupling said actual values to the comparator means, the comparator means further including means for calculating position adjusting values for the ink dosing elements based upon current position values of the ink dosing elements and upon the comparisons of actual ink density values with desired ink density values; and

second microcomputer means, receiving the position adjusting values from the comparator means, for controlling the adjustment means and for coupling the subsequent current position values of the ink dosing elements from the adjustment means to the comparator means, the comparator means further including means for relating the current position values with the position adjusting values to indicate nonconformities.

4,200,933

METHOD OF AUTOMATICALLY CALIBRATING A MICROPROCESSOR CONTROLLED DIGITAL MULTIMETER

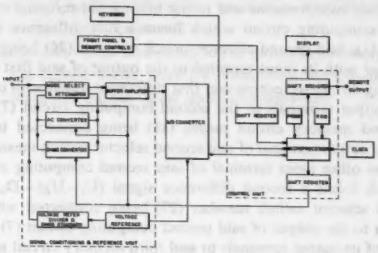
Walter Nickel, Walnut Creek, and Zoltan Tarczy-Hornoch, Berkeley, both of Calif., assignors to Systron-Donner Corporation, Concord, Calif.

Continuation-in-part of Ser. No. 710,218, Jul. 30, 1976, abandoned. This application Sep. 16, 1976, Ser. No. 724,005

Int. Cl.[2] **G01R** *35/00;* **G06F** *15/20*

U.S. Cl. 364—571 **6 Claims**

1. A method of automatically calibrating a microprocessor controlled digital multimeter comprising the following steps: measuring the error in selected modes and ranges for two points between a voltage reference and the actual output of the multimeter at said two points including making a plurality of internal self-calibration measurements, storing the results of



such measurements as constants, determining which of such constants are relevant with respect to each of such selected modes and ranges, and utilizing the relevant constants for providing digital correction for each of said modes and ranges.

4,200,934

CIRCUIT ARRANGEMENT FOR CORRECTING DIGITAL SIGNALS

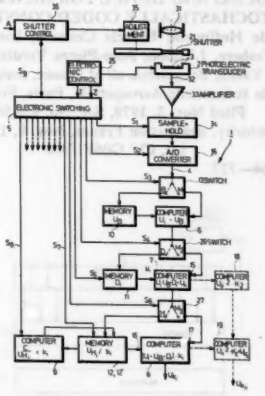
Otto Hofmann, Kirchstockach, Fed. Rep. of Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 29, 1978, Ser. No. 891,291

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1977, 2714777

Int. Cl.[2] **G01J** *3/42;* **H04N** *5/14*

U.S. Cl. 364—571 **9 Claims**



1. An electronic circuit arrangement for correcting the output signals of a photoelectric image transducer which includes a plurality of photoelectric transducer elements, said circuit arrangement comprising analog-to-digital converter means having an input operatively connected to said image transducer and a digital signal output, a plurality of selector switch means (**13**, **26**, **27**) including first, second, and third selector switch members each having an input terminal and two alternate output terminals, a like plurality of computer means (**6**, **7**, **8**) including first, second, and third circuits each having two inputs and an output, first, second and third memory circuit means (**10**, **11**, **12**) each having at least one input and an output, and electronic switching control means (**5**, **25**) operatively connected to said circuit arrangement, said first

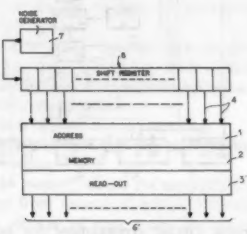
selector switch member (13) being connected with its input terminal to said digital signal output (4) of said analog-to-digital converter means and with one of its outputs to one input of said first computing circuit (6), said first memory circuit means (10) being connected to the other output terminal of said first selector switch means and to the other input terminal of said first computing circuit which forms a first difference signal $U_i - U_B$, said second selector switch member (26) being connected with its input terminal to the output of said first computing circuit to receive said first difference signal with one of its output terminals to the second computing circuit (7) said second memory circuit means (11) being connected to the other output terminal of said second selector switch means and to the other input terminal of said second computing circuit which forms a second difference signal $(U_i - U_B) - D_i$, said third selector switch member (27) being connected with its input to the output of said second computing circuit (7) with one of its output terminals to said third memory circuit means and with its other output terminal to said third computing circuit (17), said third memory circuit means (12) being connected with an output terminal (16) to said third computing circuit (17) which multiplies the second difference signal $(U_i - U_B) - D_i$ with a correction factor K_i which is proportional to the slope of the characteristic curve of a respective photoelectric transducer element (3) to form real time corrected output signals U_{Ki} for each image point signal U_i of a photoelectric transducer element, wherein U_B is a reference signal representative of a respective scanning period and wherein D_i is a dark signal of the respective scanned photoelectric transducer element.

4,200,935

PROCESS AND DEVICE FOR GENERATING STOCHASTICALLY CODED CONSTANTS

Jean-Claude Hoffmann; Francis Castanie, both of Toulouse; Henri Crabere, L'Union; Jean-Pierre Verdier, Cazeres, and Norbert Voisin, Bruguieres, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Nov. 2, 1978, Ser. No. 956,966
Claims priority, application France, Nov. 9, 1977, 77 33774
Int. Cl.[2] G06F *7/00*
U.S. Cl. 364—717 **3 Claims**



1. A process for obtaining a plurality of stochastically coded constants, comprising the steps of:

programming a passive memory with a plurality of words each formed of bits consisting of logic ones and zeros,

said words being arranged in lines with said bits in columns, the ratio of the number of logic ones appearing in a column to the total number of said lines being equal to one of said constants,

addressing said memory by means of an equiprobable address generator, and

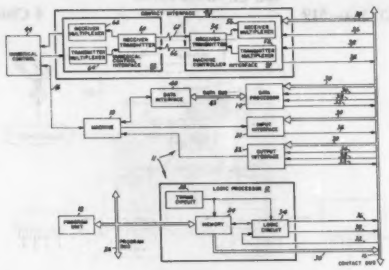
reading from the memory the sequences of bits column by column.

4,200,936

ASYNCHRONOUS BIDIRECTIONAL DIRECT SERIAL INTERFACE LINKING A PROGRAMMABLE MACHINE FUNCTION CONTROLLER AND A NUMERICAL CONTROL

Paul S. Borzcik, Cincinnati, Ohio, and Frank W. Hesford, Letchworth, England, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Aug. 17, 1976, Ser. No. 715,132
Int. Cl.[2] G06F *3/04*; G05B *19/18*
U.S. Cl. 364—900 **5 Claims**



1. An apparatus for transmitting single data bit input and output signal states representing the operation of devices on a machine between a numerical control and an asynchronously operating programmable machine function controller located with the machine, said numerical control generating input signal states to control a machine cycle of operation, said controller generating output signal states in response to predetermined combinations of input signal states and address signals to identify the input and output signals, and said controller being connected to a single data bit contact bus for communicating the input and output signal states with the controller, the apparatus comprising:

(a) a first receiver/transmitter located with and electrically coupled to the controller, said first receiver/transmitter operating asynchronously from the controller and the numerical control for continuously transmitting the output signal states during continuously occurring transmit cycles and receiving the input signal states;

(b) a second receiver/transmitter located with and electrically coupled between the first receiver/transmitter and the numerical control, said second receiver/transmitter operating asynchronously from the first receiver/transmitter, the numerical control and the controller for transmitting the input signal states during continuously occurring transmit cycles and receiving the output signal states;

(c) a first multiplexing circuit connected between the first receiver/transmitter and the controller and including

(1) a first buffer store comprising a first transmit signal store responsive to the output signal states from the contact bus and a first receive signal store responsive to the input signal states from the first receiver/transmitter,

(2) first means operating independently of the controller for transferring the input signal states from the first receiver/transmitter to the first receive signal store in response to the first receiver/transmitter receiving a number of input signal states, said first transferring means further transferring the output signal states from the first transmit signal store to the first receiver/transmitter in response to the first receiver/transmitter being ready to accept a number of output signal states, and

(3) first means responsive to the address signals for controlling the transmission of the input and output signal states between the contact bus and the first buffer store; and

(d) a second multiplexing circuit connected between the

second receiver/transmitter and the numerical control and including

(1) a second buffer store comprising a second transmit signal store responsive to the input signal states from the numerical control and a second receive signal store responsive to the output signal states from the second receiver/transmitter,

(2) second means operating independently of the numerical control for transferring the input signal states from the second transmit signal store to the second receiver/transmitter in response to the second receiver/transmitter being ready to accept a number of input signal states, said second transferring means further transferring the output signal states from the second receiver/transmitter to the second receive signal store in response to the second receiver/transmitter receiving a number of the output signal states, and

(3) second means connected to the numerical control and the second buffer store for controlling the transfer of input and output signal states therebetween.

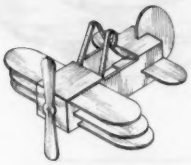
DESIGN PATENTS

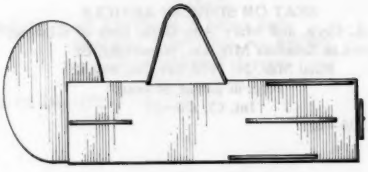
GRANTED APR. 29, 1980

ERRATA

For CLASS	See PATENT NO.
D26–024	254,875

254,816
COSTUME
Troy E. Sloan, 3634 E. Donner Ave., Fresno, Calif. 93726
Filed Jul. 21, 1977, Ser. No. 817,560
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—79





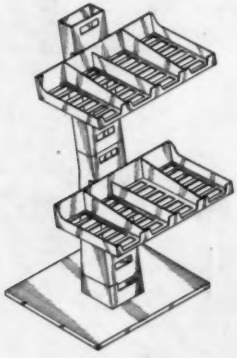
254,818
ORTHOPEDIC INSOLE
Robert H. Jones, 4107 Riverside Dr., Apt. C, Coral Springs, Fla. 33065
Filed Jan. 5, 1978, Ser. No. 867,424
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—318

254,817
SPORTS SHOE
Shiro Gonda, Kashiwara, Japan, assignor to Mizuno Sporting Goods Co., Ltd., Osaka, Japan
Filed May 15, 1978, Ser. No. 905,807
Claims priority, application Japan, Nov. 25, 1977, 52-46802
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

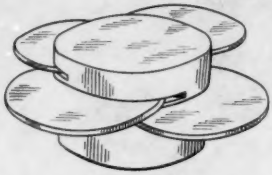
254,819
ATTACHE CASE
Michael Harrison, New York, N.Y., assignor to SPC Merchandise Ltd., New York, N.Y.
Filed Feb. 27, 1978, Ser. No. 875,764
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

254,820
REFILLABLE TOOTHPASTE BRUSH
John M. Harris, P.O. Box 2819, West Palm Beach, Fla. 33402
Filed Feb. 21, 1978, Ser. No. 879,817
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—18

254,821
CIGARETTE PACKAGE DISPLAY RACK
Kenneth J. Rabas, Waukesha, Wis., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Jun. 8, 1978, Ser. No. 913,712
Term of patent 14 years
Int. Cl. D20—*02;* D6—*04*
U.S. Cl. D6—23

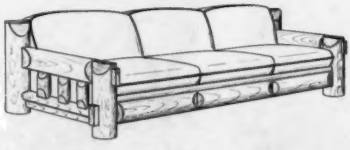


254,822
TABLE
Gabriella Crespi, Via Turati, 3, Milan, Italy
Filed Oct. 7, 1977, Ser. No. 840,473
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

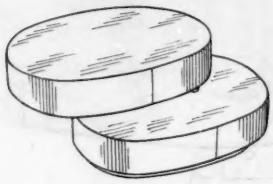


254,823
SEAT OR SIMILAR ARTICLE
Robert A. Gera, and Mary Ann Gera, both of Glencoe, Ill., assignors to Kroehler Mfg. Co., Naperville, Ill.
Filed Mar. 24, 1978, Ser. No. 889,827
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—62

254,824
UPHOLSTERED SOFA
Lester Beall, Jr., High Point, N.C., assignor to Economy Furniture Industries, Austin, Tex.
Filed Nov. 29, 1977, Ser. No. 855,913
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



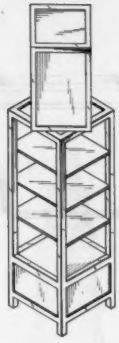
254,825
TABLE
Gabriella Crespi, Via Turati, 3, Milan, Italy
Filed Oct. 7, 1977, Ser. No. 840,466
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



254,826
TABLE
Gabriella Crespi, Via Turati, 3, Milan, Italy
Filed Oct. 7, 1977, Ser. No. 840,472
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

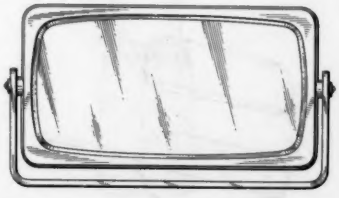
254,827
END TABLE OR SIMILAR ARTICLE
Jerry L. Johnson, Rancho Cuerdo - Box 50, Potrero, Calif. 92063
Filed Dec. 5, 1977, Ser. No. 857,880
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

254,828
DISPLAY STAND
Fred W. Kates, New York, N.Y., assignor to Revlon, Inc., New York, N.Y.
Filed Jun. 20, 1978, Ser. No. 917,157
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—186

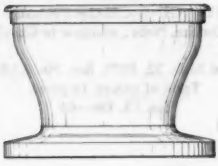


254,829
HANGING CHAIR FRAME
Phillip A. Gass, Omaha, Nebr., assignor to Gass Industries, Inc., Omaha, Nebr.
Filed Mar. 22, 1979, Ser. No. 22,811
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

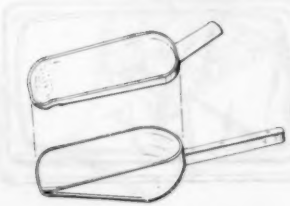
254,830
DOUBLE SIDED MIRROR
Jean-Louis Wachtel, Selestat, France, assignor to Celluloid, S.A., France
Filed Apr. 19, 1977, Ser. No. 788,903
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—237



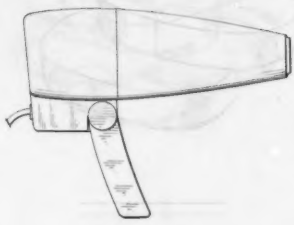
254,831
COMBINED CONTAINER AND SERVING DISH OR THE LIKE
Ernest L. Smith, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Jan. 11, 1977, Ser. No. 758,523
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—17



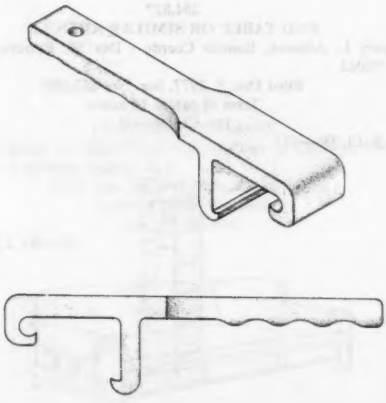
254,832
SCOOP
Vito Zappa, Somerville, N.J., assignor to Bel-Art Products
Filed Oct. 3, 1977, Ser. No. 839,216
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—104



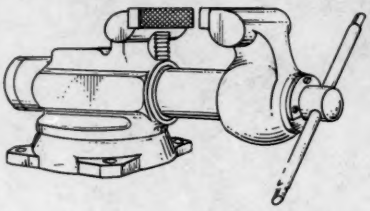
254,833
HAND-HELD VACUUM CLEANER
Marvin Cooper, New Rochelle, N.Y., assignor to Dynamic Classics, Ltd., New York, N.Y.
Filed Feb. 13, 1978, Ser. No. 877,415
Term of patent 14 years
Int. Cl. D7—*05*; D28—*03*
U.S. Cl. D7—164



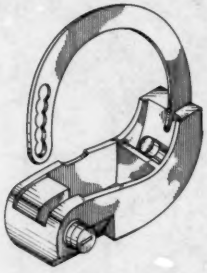
254,834
FOOD CONTAINER OPENER
Dean J. Madsen, 21 Middleridge La. North, Rolling Hills, Calif. 90274; Robert G. Madsen, 6801 Lawn Haven Dr., Huntington Beach, Calif. 92648, and Gordon W. Nichols, 13241 Rutgers Ave., Downey, Calif. 90241
Filed Jun. 20, 1977, Ser. No. 808,256
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D8—18



254,835
VISE OR SIMILAR ARTICLE
Sheldon E. Bass, 1350 E. 17th St., Los Angeles, Calif. 90021
Filed Jul. 25, 1977, Ser. No. 818,402
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74



254,836
VEHICLE IGNITION SWITCH LOCK
Lawrence Tankel, West Roxbury, Mass., assignor to Car Cuf Industries, Inc., Brookline, Mass.
Filed Jul. 3, 1978, Ser. No. 921,875
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—333



254,837
WEDGE FOR HOLDING A GAS PUMP NOZZLE IN THE OPEN POSITION
Claude S. Breaux, 3728 Franklin Ave., New Orleans, La. 70122
Filed Oct. 17, 1978, Ser. No. 952,112
Term of patent 14 years
Int. Cl. D8—*08*; D11—*01*; D15—*92*; D23—*01*
U.S. Cl. D8—349

254,838
DISPENSING BOTTLE
Anthony R. Agnone, New York, N.Y., and Michael P. Lucas, Hingham, Mass., assignors to The Gillette Company, Boston, Mass.
Filed Dec. 16, 1977, Ser. No. 861,274
Term of patent 14 years
Int. Cl. D09—*01*
U.S. Cl. D9—9

254,839
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of Ser. No. 640,204, Dec. 12, 1975, Pat. No. Des. 245,759. This application Sep. 6, 1977, Ser. No. 830,483
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130

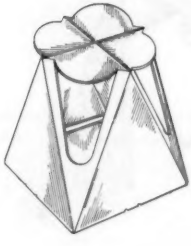
254,840
BOTTLE
Thomas B. Aldrich, III, Spring Valley, N.Y., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed May 4, 1977, Ser. No. 793,905
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

254,841
BOTTLE
Edwin F. Neu, 6300 Center Rd., Cincinnati, Ohio. 45224. Thomas B. Aldrich, III, Spring Valley, N.Y., assignor to Edwin F. Neu, Cincinnati, Ohio and The Procter & Gamble Company, Cincinnati, Ohio.
Filed May 4, 1977, Ser. No. 793,904
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—155

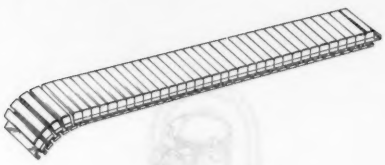
254,842
COMBINED CONTAINER AND CUTTER FOR CAPSULES OR THE LIKE
Howard E. Berner, Summit, N.J., assignor to Pharmacaps, Inc., Elizabeth, N.J.
Filed May 2, 1977, Ser. No. 793,170
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

254,843
PACKAGE OF HANDKERCHIEFS
Will Kaplan, New York, N.Y., assignor to Dumont Handkerchiefs, Inc., New York, N.Y.
Filed Apr. 25, 1977, Ser. No. 790,236
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193

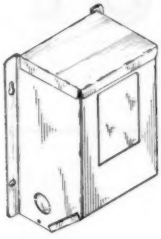
254,844
CARTON
Harold Cravens, Woodridge, Ill., assignor to H. Fishlove & Co., Chicago, Ill.
Filed Nov. 3, 1977, Ser. No. 848,076
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



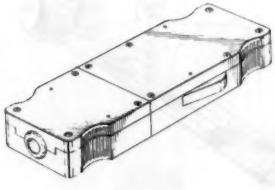
254,845
FLEXIBLE WRIST BAND
Lonas S. Young, 9760 E. Rosewood, Tucson, Ariz. 85710
Filed Nov. 18, 1977, Ser. No. 852,848
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—25



254,846
ELECTRICAL TRANSFORMER OR SIMILAR ARTICLE
Don C. Wood, Ft. Wayne, Ind., assignor to General Electric Company, Carmel, Ind.
Filed Jun. 6, 1978, Ser. No. 913,436
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—4



254,847
COMBINED PLUG AND SOCKET THEREFOR
Arthur L. Healey, Ballards, Poplar Ave., Windlesham, Surrey, England
Filed Jan. 31, 1978, Ser. No. 874,236
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

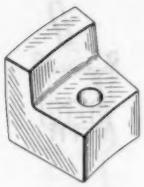


254,848
SWITCH
Minoru Sano, Yokosuka, Japan, assignor to Fujisoku Electric Co., Ltd., Kawasaki, Japan
Filed Jul. 25, 1978, Ser. No. 928,008
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—37

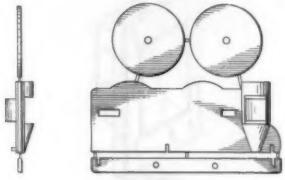
254,849
LIGHT-INTENSITY CONTROL CONTACT SWITCH
Takehiko Matsuda, Matsudo, Japan, assignor to Toyostar Corporation, Tokyo, Japan
Filed Feb. 15, 1979, Ser. No. 12,511
Claims priority, application Japan, Sep. 30, 1978, 53/41770
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38

254,850
PORTABLE SEWING MACHINE
Hilmar Wittler, Karlsruhe, Fed. Rep. of Germany, assignor to The Singer Company, New York, N.Y.
Filed Feb. 27, 1978, Ser. No. 881,311
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D15—75

254,851
ROCK CRUSHER TABLE LINER
Stephen B. Ackers, Portland, Oreg., and Neil M. Rose, Vancouver, Wash., assignors to Canica Crushers, Ltd., Vancouver, Wash.
Filed Apr. 25, 1977, Ser. No. 790,572
Term of patent 14 years
Int. Cl. D15—*99*; D8—*99*
U.S. Cl. D15—123



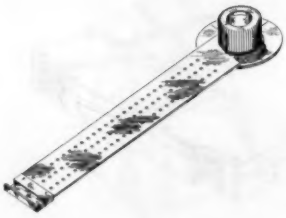
254,852
KIT FOR ASSEMBLING A COMBINED CALENDAR AND WRITING INSTRUMENT HOLDER
Sam Kupperman, Chicago, and Dennis Kupperman, Glenview, both of Ill., assignors to RB Toy Development Co., Skokie, Ill.
Filed Mar. 6, 1978, Ser. No. 884,045
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—23



254,853
COMBINED PENCIL CADDY AND PERPETUAL CALENDAR
Jerome A. Grunstad, St. Paul, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 3, 1978, Ser. No. 893,105
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—23

254,854
COMBINED PEN AND RING
Genaro Texidor, 522 W. 136th St., New York, N.Y. 10031
Filed Apr. 17, 1978, Ser. No. 896,995
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—36

254,855
COMPASS
Ted A. Corrington, 315 Northland, Pocatello, Id. 83201, and Forrest K. Blair, Box 26, Inkom, Id. 83245
Filed Nov. 17, 1977, Ser. No. 852,337
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—38



254,856

PEN WITH CHAIN

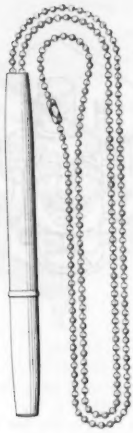
Harold F. Bajusz, Woodridge, N.J., assignor to Accutec, Inc., Wallington, N.J.

Continuation-in-part of Ser. No. 641,903, Dec. 18, 1975, abandoned. This application Feb. 9, 1976, Ser. No. 656,633

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—44



254,857

TEACHING AID FIGURE

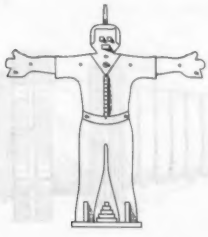
Kenneth W. Ehle, R.R. #1, Wolcottville, Ind. 46795

Filed Jan. 5, 1978, Ser. No. 867,086

Term of patent 14 years

Int. Cl. D19—*07*

U.S. Cl. D19—64



254,858

PENCIL SHARPENER

Werner Möbius, Hindenburgstrasse 77, Erlangen, Fed. Rep. of Germany

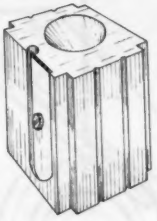
Filed Feb. 23, 1978, Ser. No. 880,350

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 7372

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—73



254,859

COMBINED PEN STAND AND CLIP WELL

Jerome A. Grunstad, West St. Paul, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

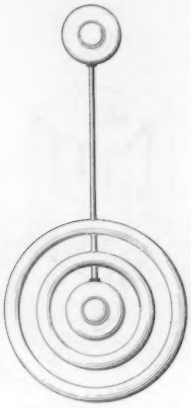
Filed Apr. 3, 1978, Ser. No. 893,112

Term of patent 14 years

Int. Cl. D19—*02*

U.S. Cl. D19—75

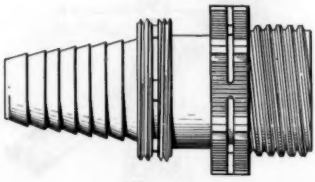
254,860
COMBINED GRASPING AND HANDLING TOY RATTLE OR SIMILAR ARTICLE
Richard A. Chase, Baltimore, Md.; D. Michael Williams, Morin Heights, Canada, and Danny E. Simpson, Baltimore, Md., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed Mar. 8, 1978, Ser. No. 884,655
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65



254,861
PATRIOTIC DOLL
Kathryn McNamee, 23 Brookline St., Worcester, Mass. 01608
Filed Aug. 9, 1978, Ser. No. 932,124
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

254,862
CLOWN TOY FOR A CRIB
Richard A. Botto, Ridgefield Park, N.J., assignor to CBS Inc., New York, N.Y.
Filed Oct. 31, 1977, Ser. No. 846,967
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—173

254,863
HOSE COUPLING FITTING
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.
Filed Oct. 3, 1977, Ser. No. 838,964
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—44



254,864

STOVE

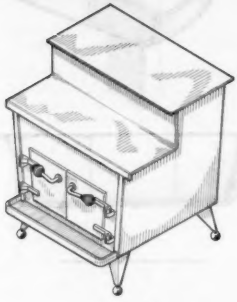
Floyd R. Skabelund, 3224 S. 1575 East, Salt Lake City, Utah 84106, and Donald Skabelund, 2827 Junalee Dr., W. Jordan, Utah 84084

Filed Oct. 31, 1977, Ser. No. 847,318

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—97



254,865

WOOD BURNING STOVE

Andrew L. C. Saye, Harrow Cottage, Froxfield, Marlborough, Wiltshire, England

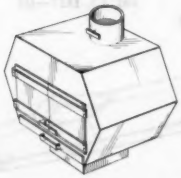
Filed Jan. 11, 1978, Ser. No. 868,616

Claims priority, application United Kingdom, Jul. 19, 1977, 980824/77

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—97



254,866

AIR FLOW DEFLECTOR

Lennart Gustavsson, Vaxjo, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

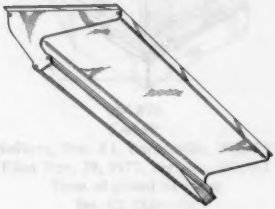
Filed Feb. 24, 1978, Ser. No. 881,154

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1977, 805/77

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—139



254,867

AIR FRESHNER DISPENSER

James W. Marsh, Apartado 13231, Madrid, Spain

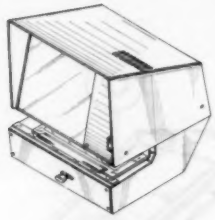
Filed Jun. 20, 1977, Ser. No. 808,240

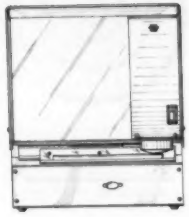
Term of patent 14 years

Int. Cl. D23—*04*

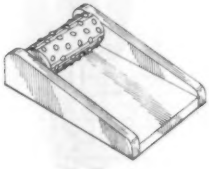
U.S. Cl. D23—150

254,868
X-RAY FILM VIEWER
Howard W. Hoadley, 9143 Petit Ave., Sepulveda, Calif. 91343
Filed Jul. 28, 1977, Ser. No. 819,990
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—2

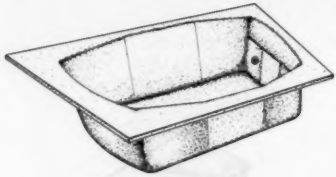




254,869
FOOT MASSAGER
Page M. Osburn, 5427 S. Louthan Way, Littleton, Colo. 80120
Filed Dec. 19, 1977, Ser. No. 862,228
Term of patent 14 years
Int. Cl. D28—*03;* D21—*02*
U.S. Cl. D24—36

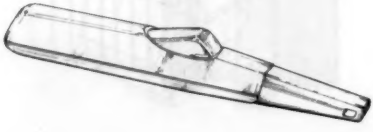


254,870
WHIRLPOOL BATHTUB
Philip I. Ogden, 508 E. 46th St., Boise, Id. 83704
Filed Jan. 16, 1979, Ser. No. 3,852
Term of patent 14 years
Int. Cl. D24—*02;* D23—*02*
U.S. Cl. D24—38

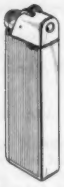


254,871
ASH TRAY
Jerome A. Grunstad, St. Paul, Minn., assignor to Ketcham & McDougall, Inc., Roseland, N.J.
Filed Apr. 3, 1978, Ser. No. 893,111
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—22

254,872
GAS-LIGHTER
Lisio Plozner, Pordenone, Italy, assignor to B.P.T. S.p.A., Venice, Italy
Filed Mar. 28, 1978, Ser. No. 891,101
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

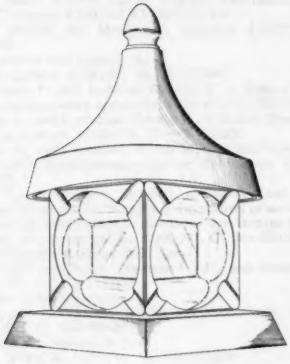


254,873
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed Oct. 25, 1977, Ser. No. 845,164
Claims priority, application Japan, Jul. 14, 1977, 52-27411
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



254,874
COMBINED AQUARIUM AND TERRARIUM
Clayton Totten, P.O. Box 66, Sedalia, N.C. 27342
Filed Oct. 12, 1978, Ser. No. 950,708
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—11

254,875
LAMP
Terry C. Stekelberg, Rte. #1, Pardeeville, Wis. 53954
Filed Nov. 29, 1977, Ser. No. 855,601
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—24



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 29TH DAY OF APRIL, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. E. Staley Manufacturing Company: *See*—
Orthoefer, Frank T., 4,200,551, Cl. 252-312.000.

A. O. Smith Corporation: *See*—
Buckman, John B.; and Lykes, Robert E., 4,199,861, Cl. 29-598.000.

Abbott Laboratories: *See*—
Stein, Robert G.; Couch, Terry L.; and Michaels, Raymond J., 4,200,654, Cl. 424-330.000.
Stroupe, Stephen D.; and Moore, Edwin G., 4,200,435, Cl. 23-230.00B.

Abe, Takaharu: *See*—
Nakamura, Yoshiaki; and Abe, Takaharu, 4,200,191, Cl. 206-328.000.

Abe, Toshizo; Goko, Nobuaki; Nishihara, Yasuhiro; and Matuda, Yukimasa, to Mitsubishi Chemical Industries, Ltd. Preparation of propylene polymer-containing solid titanium trichloride and propylene polymers using same. 4,200,717, Cl. 526-159.000.

ACF Industries, Inc.: *See*—
Dye, S. Owen, 4,200,595, Cl. 261-39.00B.

Adams, Cecil L.; and Warner, Norman E., to Parker-Hannifin Corporation. Accumulator for air conditioning systems. 4,199,960, Cl. 62-503.000.

Aebi, Rudolf: *See*—
Vogel, Christian; and Aebi, Rudolf, 4,200,451, Cl. 71-118.000.

Agar, Robert F., to William H. Rorer, Inc. Shield for topically treated animals. 4,200,057, Cl. 119-1.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
Liesse, Maurice, 4,200,213, Cl. 227-10.000.

Agency of Industrial Science & Technology: *See*—
Nomura, Harehiko; Koyama, Kenichi; and Terao, Kazuhiko, 4,200,767, Cl. 174-126.00S.

AGFA-Gevaert, A.G.: *See*—
Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,200,364, Cl. 352-141.000.
Kluczynski, Achim; and Altmann, Erik, 4,200,247, Cl. 242-71.200.

Agnew, Kenneth M.; Denroche, Charles H. P.; and Hewlett, Roy. Loose leaf binders. 4,200,404, Cl. 402-22.000.

Aguettant, Georges, to Laboratoire Aguettant. Device for stoppering and connecting a container containing a sterile liquid. 4,200,209, Cl. 222-541.000.

Agulnek, Martin A., to Xerox Corporation. Modular array. 4,200,788, Cl. 250-235.000.

Agyagos, Ferenc I. Multiple exerciser device. 4,200,282, Cl. 272-146.000.

Ahlberg, Hakan B.: *See*—
Sunden, Olof; Johansson, Hans; Ahlberg, Hakan B.; and Karlsson, Per-Arne I., 4,200,548, Cl. 252-135.000.

Ahlbrandt, Thomas S.: *See*—
Fryberger, Steven G.; and Ahlbrandt, Thomas S., 4,199,974, Cl. 73-28.000.

Ahrweiler, Karl-Heinz, to Kusters, Eduard. Apparatus for the manufacture of sheets. 4,200,430, Cl. 425-81.100.

Aikawa, Tetsuo: *See*—
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.

AIMAC, Inc.: *See*—
Boettcher, Carl E., 4,200,186, Cl. 198-800.000.

Air Preheater Company, Inc., The: *See*—
Renko, Ronald J., 4,200,440, Cl. 55-131.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,200,205, Cl. 220-20.500.
Ohmi, Atushi, 4,200,029, Cl. 91-369.00A.
Sakakibara, Naoji, 4,200,068, Cl. 123-102.000.

Aizawa, Hiroshi; Uchidoi, Masar[illegible]i; Nakamura, Zenzo; and Takishima, Yoshiyuki, to Canon Kabushi[illegible]isha. Camera for daylight and flash photography. 4,200,370, Cl. [illegible]3.000.

Aizawa, Hiroshi: *See*—
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,200,374, Cl. 354-60.00R.

Akashi, Goro: *See*—
Sasazawa, Koji; Komine, Shigeo; Kitamoto, Tatsuji; and Akashi, Goro, 4,200,680, Cl. 428-403.000.

Akbar, Mohammed: *See*—
Kwant, Pieter B.; Kanbier, Dirk; Tjan, Petrus W. H. L.; and Akbar, Mohammed, 4,200,519, Cl. 208-77.000.

Akers, Larry D.; and Scholl, Charles H., to Nordson Corporation. Hot melt adhesive foam pump system. 4,200,207, Cl. 222-190.000.

Akeyama, Masamoto: *See*—
Imai, Kuninori; Takahashi, Soji; and Akeyama, Masamoto, 4,200,217, Cl. 228-161.000.

Akiyama, Tatehito, to C. Itoh Fashion System Co., Ltd. Color harmony scale. 4,199,877, Cl. 35-28.300.

Aktiebolaget Bofors: *See*—
Borjesson, Jan; and Eriksson, Bertil, 4,200,251, Cl. 244-3.130.

Aktiebolaget Carl Munters: *See*—
Hedbom, Hans S., 4,200,147, Cl. 165-104.00S.

Aktiebolaget Electrolux: *See*—
Simonsson, Sven B., 4,199,838, Cl. 15-339.000.

Aktiebolaget IRO: *See*—
Wilson, Peter, 4,199,965, Cl. 66-125.00R.

Aladdin Industries, Incorporated: *See*—
Perkins, William A.; and Tanner, William J., 4,200,199, Cl. 220-420.000.

Albach, Eberhard R., to Libbey-Owens-Ford Company. Stacking glass sheets. 4,200,670, Cl. 427-154.000.

Albaric, Jacques E.; Coyle, Forrest E.; and Sherlock, Thomas P., to Westinghouse Electric Corp. Hollow shaft bore heater assembly. 4,200,784, Cl. 219-470.000.

Albright, Charles W.: *See*—
Welter, Charles R.; Liss, Barry; Davis, Hubert G.; and Albright, Charles W., 4,200,494, Cl. 201-9.000.

Alexander, George: *See*—
Briner, Clifton; and Alexander, George, 4,200,038, Cl. 98-84.000.

Alexeev, Antonina I.: *See*—
Alexeev, Kirill M.; and Alexeev, Antonina I., 4,200,084, Cl. 123-222.000.

Alexeev, Kirill M.; and Alexeev, Antonina I. Rotary piston engine. 4,200,084, Cl. 123-222.000.

Alfa Farmaceutici, S.p.A.: *See*—
Brufani, Mario; Marchi, Egidio; Bellomo, Pierfranco; and Mascellani, Giuseppe, 4,200,573, Cl. 260-239.30P.
Marchi, Egidio; and Montecchi, Lauretta, 4,200,574, Cl. 260-239.30P.

Alfa-Laval Stalltechnik GmbH: *See*—
Baum, Engelbert, 4,200,597, Cl. 261-87.000.

Alfrey, Clarence P.; and Bedford, Donald B., to Ramco Laboratories Inc. Radioimmunoassay apparatus. 4,200,613, Cl. 422-71.000.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. Thiazole derivatives. 4,200,578, Cl. 548-193.000.

Algieri, Aldo A.; and Crenshaw, Ronnie R., to Bristol-Myers Company. Imidazolylalkylthioalkylamino-ethylene derivatives. 4,200,760, Cl. 548-342.000.

Allan, Iain D.; and Walberg, Per-Erik, to Sperry Rand Corporation. Method and apparatus for weighting the priority of access to variable length data blocks in a multiple-disk drive data storage system having an auxiliary processing device. 4,200,928, Cl. 364-200.000.

Allegheny Ludlum Industries, Inc.: *See*—
Datta, Amitava; Miller, Clarence L., Jr.; and Shilling, Jack W., 4,200,477, Cl. 148-113.000.

Allen-Bradley Company: *See*—
Struger, Odo J.; Grants, Valdis; and Grudowski, Raymond A., 4,200,915, Cl. 364-900.000.

Allied Chemical Corporation: *See*—
Chang, Irving B., 4,200,561, Cl. 260-23.00H.
Hamilton, Brian K.; Garner, Eugene F.; and Harrell, Terry R., 4,200.615, Cl. 422-166.000.
Pez, Guido, 4,200,716, Cl. 526-141.000.
Van Peppen, Jan F.; and Fisher, William B., 4,200,553, Cl. 252-447.000.

Allis-Chalmers Corporation: *See*—
Schaale, Robert G., 4,200,514, Cl. 264-262.000.

Alpha Techno Company: *See*—
Okamura, Kenichiro; and Nakamuru, Yasuo, 4,200,549, Cl. 252-182.000.

Alps Electric Co., Ltd.: *See*—
Komatsu, Hiroaki; and Oka, Tsumoru, 4,200,773, Cl. 200-11.00R.
Sato, Mikio; and Magami, Kozo, 4,200,857, Cl. 338-174.000.

Altmann, Erik: *See*—
Kluczynski, Achim; and Altmann, Erik, 4,200,247, Cl. 242-71.200.

Aluminum Company of America: *See*—
Willis, Wilburn C., 4,200,100, Cl. 128-272.300.

Aluminum Pechiney: *See*—
Morel, Paul; and Dugois, Jean-Pierre, 4,200,513, Cl. 204-243.00M.

Alvares, Antonio: *See*—
Biglione, Gianfranco; Bertazzoni, Guido; and Alvares, Antonio, 4,200,696, Cl. 521-58.000.

Alza Corporation: *See*—
Ayer, Atul D.; and Theeuwes, Felix, 4,200,098, Cl. 128-260.000.

Ambrose, Robert L., to Handal, Anthony H., a part interest. Multiple-sized ring. 4,199,962, Cl. 63-15.000.

American Can Company: *See*—
Hein, Carl C., III; and Spitz, Joseph J., 4,200,200, Cl. 221-48.000.

Mitchell, Richard P., 4,199,917, Cl. 53-441.000.
Ramich, Gary A., 4,200,219, Cl. 229-16.00A.

American Cyanamid Company: *See—*
Tucker, Robert J., 4,200,433, Cl. 8-42.00D.
Wright, William B., Jr.; and Tomcufcik, Andrew S., 4,200,748, Cl. 544-99.000.

American National Red Cross: *See—*
McGill, Manley, 4,199,954, Cl. 62-62.000.

American Science & Engineering, Inc.: *See—*
Swift, Roderick D., 4,200,800, Cl. 250-445.00T.

American Standard Inc.: *See—*
Briner, Clifton; and Alexander, George, 4,200,038, Cl. 98-84.000.

AMF Incorporated: *See—*
Schmidt, Otto K., 4,200,113, Cl. 131-17.000.

AMP Incorporated: *See—*
Zimmerman, John A., Jr., 4,200,350, Cl. 339-91.00R.

Anahara, Ryoji; Sato, Koichi; Kaneda, Motoshiro; and Saito, Mitsuo, to Fuji Electric Co., Ltd. Method and apparatus for measuring the insulation resistance of an operating grounded transmission line system. 4,200,835, Cl. 324-51.000.

Anchor Hocking Corporation: *See—*
Ochs, Charles S.; and Herzog, James M., 4,199,914, Cl. 53-314.000.

Anderl, Siegfried, to Wurttembergische Metallwarenfabrik. Coffee machine. 4,200,039, Cl. 99-302.00R.

Anderson, Carl M., to Hesston Corporation. Spring cushioned shank for earthworking chisel having trip mechanism with automatic reset. 4,200,157, Cl. 172-264.000.

Anderson, Donald F.: *See—*
Stanley, Priscilla B.; and Anderson, Donald F., 4,200,704, Cl. 525-409.000.

Anderson, Nicholas H.: *See—*
Huff, Roger K.; Evans, David D.; and Anderson, Nicholas H., 4,200,653, Cl. 424-322.000.

Anderson, Richard M.; and Beehler, Richard F., to Heil-Quaker Corporation. Damper mechanism for fresh air intake. 4,200,117, Cl. 137-512.100.

Andrews, Harry N.: *See—*
Meuschke, Robert E.; Andrews, Harry N.; and Massaro, Anthony A., Jr., 4,200,172, Cl. 182-46.000.

Andrews, Karl H., to Wheaton Industries. Automatic mandrel checker. 4,200,428, Cl. 425-136.000.

Andrews, Melvin R.: *See—*
Andrews, Roger W.; and Andrews, Melvin R., 4,200,283, Cl. 273-108.000.

Andrews, Roger W.; and Andrews, Melvin R. Magnetic spinning top game. 4,200,283, Cl. 273-108.000.

Andros Incorporated: *See—*
Burough, Irvin G., 4,200,791, Cl. 250-343.000.

Anewalt, Robert: *See—*
Johnson, Earl W.; Reider, Malcolm J.; Anewalt, Robert; and Kring, Harry J., 4,200,526, Cl. 210-23.00H.

Anhalt, John W.; Goodman, David S.; and Selvin, Gerald J., to International Telephone and Telegraph Corporation. Cable assembly and method of making the same. 4,200,768, Cl. 174-79.000.

Anzai, Hideyuki: *See—*
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.

Aoki, Yoshihiro, to Application Art Laboratories Co., Ltd. Magnetic locking apparatus. 4,200,852, Cl. 335-285.000.

Application Art Laboratories Co., Ltd.: *See—*
Aoki, Yoshihiro, 4,200,852, Cl. 335-285.000.

Applied Power Inc.: *See—*
Skover, Nick, Jr., 4,200,031, Cl. 91-420.000.

Applied Technologies Associates: *See—*
Van Steenwyk, Donald H., 4,199,869, Cl. 33-302.000.

Aquatech, Inc.: *See—*
Fisco, Benjamin P., Jr., 4,199,837, Cl. 15-302.000.

Arai, Naoki: *See—*
Shishido, Tadao; and Arai, Naoki, 4,200,464, Cl. 430-512.000.

Araki, Yoshitaka: *See—*
Ishizaka, Sunao; and Araki, Yoshitaka, 4,200,381, Cl. 354-289.000.

Ardal og Sunndal Verk a.s.: *See—*
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.

Ardell, William E.; Burchmore, William A.; Drolet, Leo P.; and Drolet, Michel, to La Corporation Inglasco Ltee. Method of making a hockey stick. 4,200,479, Cl. 156-154.000.

Argila, Joseph: *See—*
Sinclair, William Y.; and Argila, Joseph, 4,200,347, Cl. 339-17.0CF.

Argus Gesellschaft mbH: *See—*
Walter, Friedrich C.; and Portele, Ludwig, 4,200,121, Cl. 137-614.050.

Aries Electronics, Inc.: *See—*
Sinclair, William Y.; and Argila, Joseph, 4,200,347, Cl. 339-17.0CF.

Armco Inc.: *See—*
Owens, James H., 4,199,847, Cl. 24-249.0DP.

Armijo, Joseph S.; and Coffin, Louis F., Jr., to General Electric Company. Nuclear fuel element. 4,200,492, Cl. 176-82.000.

Arnold, Dan M.; and Smith, Harry D., Jr., to Texaco Inc. Measuring oil and water cuts in a multiphase flowstream with elimination of the effects of gas in determining the liquid cuts. 4,200,789, Cl. 250-270.000.

Arsenault, Robert D., to Koppers Company, Inc. Method for preventing sticker marks on architectural grade plywood and lumber. 4,199,870, Cl. 34-24.000.

Arthur G. McKee & Company: *See—*
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,200,517, Cl. 208-11.00R.

Asada, Sadame: *See—*
Yamazaki, Kaoru; Kurioka, Shunichiro; Hatano, Takashi; Asada, Sadame; and Yasuda, Mariko, 4,200,719, Cl. 526-220.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Shono, Tetsuji, 4,200,385, Cl. 354-233.000.

Asakura, Osamu: *See—*
Nozaki, Mineo; Asakura, Osamu; and Seki, Mitsuaki, 4,200,043, Cl. 101-93.290.

Asami, Shunichi: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,200,538, Cl. 210-500.00M.

ASEA Aktiebolag: *See—*
Persson, Anders; and Soderstrom, Sven-Erik, 4,200,398, Cl. 356-437.000.
von Knorring, Folke; Lindkvist, Sven F.; and Valdemarsson, Lars S., 4,199,978, Cl. 73-133.00R.

Ashman, Arthur. Endosseous plastic implant method. 4,199,864, Cl. 433-175.000.

Atari, Inc.: *See—*
Romano, John V., 4,200,780, Cl. 200-302.000.

Ateliers de Constructions Electriques de Charleroi (ACEC): *See—*
Gillet, Auguste; Gilsoul, Paul; and Malhaize, Emile, 4,200,864, Cl. 340-507.000.

Atlantic Richfield Company: *See—*
Pedersen, Svend E.; and Sheng, Ming N., 4,200,584, Cl. 260-346.750.

Auck, Yoon T.: *See—*
Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., 4,200,455, Cl. 75-91.000.

Audesse, Emery G.: *See—*
Shaffer, John W.; Bricker, Daniel W.; and Audesse, Emery G., 4,200,901, Cl. 362-5.000.

August, Arthur; and Huber, John G., to Grumman Aerospace Corporation. Work table. 4,200,271, Cl. 269-21.000.

Ausnit, Steven, to Minigrip, Inc. Slider for heavy duty flexible fastener tracks. 4,199,845, Cl. 24-201.00C.

Austin, Milton; and Kendall, Arthur G. Fishing line release device. 4,199,890, Cl. 43-43.120.

Austin, Stewart S.: *See—*
Smith, Henry I.; Austin, Stewart S.; and Flanders, Dale C., 4,200,395, Cl. 356-356.000.

Automotive Products Limited: *See—*
Bass, Richard A.; and Grossart, Peter S. K., 4,200,163, Cl. 180-219.000.

Avery, John R. Moisture proof bag closure. 4,200,132, Cl. 150-7.000.

Avron, Mordhay; and Ben-Amotz, Ami, to Yeda Research and Development Co. Ltd. Production of glycerol, carotenes and algae meal. 4,199,895, Cl. 47-1.400.

Ayer, Atul D.; and Theeuwes, Felix, to Alza Corporation. Osmotic system with distribution zone for dispensing beneficial agent. 4,200,098, Cl. 128-260.000.

Ayer, Donald E., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-trans-4,5-didehydro-PGI_1 compounds. 4,200,740, Cl. 542-426.000.

Ayers, Jack D.: *See—*
Schaefer, Robert J.; and Ayers, Jack D., 4,200,669, Cl. 427-53.100.

Ayers, Lewis W.; and Chellel, William A. Windshield remover. 4,199,852, Cl. 29-239.000.

AZO-Maschinenfabrik Adolf Zimmermann GmbH: *See—*
Link, Otmar, 4,200,414, Cl. 406-63.000.

B. F. Goodrich Company, The: *See—*
Cohen, Louis, 4,200,712, Cl. 526-62.000.

Babler Bros., Inc.: *See—*
Babler, Richard G.; Stinchfield, George V.; and Kannard, Melvin W., 4,200,408, Cl. 404-83.000.

Babler, Richard G.; Stinchfield, George V.; and Kannard, Melvin W., to Babler Bros., Inc. Windrow pickup attachment for asphalt pavement laying apparatus. 4,200,408, Cl. 404-83.000.

Badger Company, Inc., The: *See—*
Underwood, Max E., 4,200,145, Cl. 526-64.000.

Bailey, Edgar E.; Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., to Davy Powergas, Inc. Process for purging sodium sulfate from a sulfur dioxide removal system. 4,200,619, Cl. 423-242.000.

Bailey, John M., to Caterpillar Tractor Co. Fuel injection pump. 4,200,072, Cl. 123-139.0AP.

Bains, Gurdip S.; Martin, Niles J.; and Jackson, Leigh F., to Westinghouse Electric Corp. Panel joint. 4,199,907, Cl. 52-125.000.

Bains, William R., to United States of America, Army. Multi-purpose gun safety. 4,200,028, Cl. 89-142.000.

Baker, Edward S.; and Talley, Richard M. Cable laying device. 4,200,410, Cl. 405-182.000.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Frequency divider circuit. 4,200,811, Cl. 307-225.00R.

Baldwin, Jack W., to General Motors Corporation. Hot air shroud for paint spray gun. 4,200,234, Cl. 239-296.000.

Ball, Russell M., to Electric Power Research Institute, Inc. Apparatus and method for detecting power distribution in a nuclear reactor fuel element. 4,200,491, Cl. 176-19.00R.

Bally Manufacturing Corporation: *See—*
Hooker, Donald E., 4,200,291, Cl. 273-143.00R.

Balmat, Jean L., to Du Pont de Nemours, E. I., and Company. Process for removing sulfate ions from aqueous streams. 4,200,523, Cl. 210-4.000.

Baltare, Gunnar: *See*—
Borugian, Dennis A.; and Baltare, Gunnar, 4,200,174, Cl. 188-329.000.

Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fluid reservoirs for tandem master cylinders. 4,200,205, Cl. 220-20.500.

Bant, John A., to Lucas Industries Limited. Lead-acid batteries. 4,200,683, Cl. 429-48.000.

Barbarasch, Joseph, to Singer Company, The. Visibility effects generator. 4,199,875, Cl. 35-12.00N.

Barmag Barmer Maschinenfabrik AG: *See*—
Hartig, Wolfgang; and Lenk, Erich, 4,200,212, Cl. 226-24.000.

Barnes, Gary D. Combined sinker and fishing lure. 4,199,888, Cl. 43-42.330.

Baroclem S. A.: *See*—
Moreau, Jean-Pierre, 4,199,849, Cl. 29-2.000.

Bartlett, Gary F., to Construction Specialties, Inc. Handrail and crash rail. 4,200,261, Cl. 256-59.000.

Bartlett, Oliver H., Jr.; and Izard, Charles B., to United States of America, Army. Hologram technique for establishing the integrity of packages. 4,200,394, Cl. 356-347.000.

Bartok nee Berencsy, Piroska: *See*—
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.

BASF Aktiengesellschaft: *See*—
Blinne, Gerd; and Cordes, Claus, 4,200,727, Cl. 528-125.000.
Blinne, Gerd; and Cordes, Claus, 4,200,728, Cl. 528-174.000.
Denzinger, Walter; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,200,710, Cl. 525-356.000.
Distler, Harry; and Goetze, Walter, 4,200,582, Cl. 260-343.600.
Gausepohl, Hermann; Naarmann, Herbert; Penzien, Klaus; and Stephan, Rudolf, 4,200,702, Cl. 525-72.000.
Hoffmann, Werner, 4,200,766, Cl. 568-875.000.
Linhart, Friedrich; Stubenrauch, Gerd; and Hamprecht, Gerhard, 4,200,743, Cl. 544-11.000.
Perner, Johannes; Greif, Norbert; Fikentscher, Rolf; and Diessel, Paul, 4,200,733, Cl. 528-417.000.
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.
Strobele, Caljon H., 4,200,889, Cl. 358-167.000.

BASF Wyandotte Corporation: *See*—
Panek, Edward J.; Moll, Werner O.; Bergman, Lee H.; and Kersten, Siegfried P., 4,200,501, Cl. 203-7.000.

Bashour, Joseph E. Bottle top closure. 4,200,196, Cl. 215-253.000.

Bass, Richard A.; and Grossart, Peter S. K., to Automotive Products Limited. Hydraulic actuator. 4,200,163, Cl. 180-219.000.

Bauer, Daniel; Beck, Jean-Paul; and Braque, Gerard, to L'Oreal. Dispensing container with pressure fluid operated dispensing pump. 4,200,204, Cl. 222-133.000.

Bauer, Hans J. Angle joint. 4,200,405, Cl. 403-142.000.

Bauer, Wolfgang: *See*—
Korn, Hans; Grothe, Klaus; and Bauer, Wolfgang, 4,200,309, Cl. 280-750.000.

Bauers, William R.; Mioduski, Paul; and Ceccon, Claude R., to Bauers, William Roy. Electronic system for measuring time, impact energy and other athletic parameters. 4,199,987, Cl. 73-379.000.

Bauers, William Roy: *See*—
Bauers, William R.; Mioduski, Paul; and Ceccon, Claude R., 4,199,987, Cl. 73-379.000.

Baum, Engelbert, to Alfa-Laval Stalltechnik GmbH. Device for revolving liquids and supplying gas thereto. 4,200,597, Cl. 261-87.000.

Baumann, Arthur, to Mettler Instrument AG. Method and system for controlling a multi-segment indicator to furnish an analogue display indicating only the relationship of the measured value to a desired value or range of values. 4,200,896, Cl. 364-570.000.

Baumann, Claude: *See*—
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.

Bax, Ronald F., to Pfizer Inc. Continuously rotating CAT scanning apparatus and method. 4,200,797, Cl. 250-402.000.

Bayer Aktiengesellschaft: *See*—
Feyen, Peter; Preiss, Michael; and Metzger, Karl G., 4,200,576, Cl. 424-246.000.
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,200,643, Cl. 424-272.000.
Kyri, Hans; Lauss, Hans-Dietrich; and Schneider, Siegfried, 4,200,622, Cl. 423-471.000.
Maurer, Fritz; Schroder, Rolf; and Hammann, Ingeborg, 4,200,637, Cl. 424-251.000.
Petersen, Otto; and Schmidt, Hans-Dieter, 4,200,512, Cl. 204-195.00R.
Wingler, Frank; Casper, Clemens; and Liebig, Lothar, 4,200,713, Cl. 526-64.000.

Baylis, Anthony B.: *See*—
Slinkard, William E.; Baylis, Anthony B.; and Hughes, Michael P., 4,200,764, Cl. 562-549.000.

BBC Brown Boveri & Company Limited: *See*—
Bratoljic, Tihomir, 4,200,817, Cl. 310-198.000.
Pfenninger, Hans, 4,199,933, Cl. 60-39.120.

BCIRA: *See*—
Godding, Ronald G., 4,200,272, Cl. 269-26.000.

Beck, Edward D., to Minnesota Mining and Manufacturing Company. Matrix-bonded permanent magnet having highly aligned magnetic particles. 4,200,547, Cl. 252-62.540.

Beck, Jean-Paul: *See*—
Bauer, Daniel; Beck, Jean-Paul; and Braque, Gerard, 4,200,204, Cl. 222-133.000.

Becker, Veit; Feinendegen, Ludwig; and Pollermann, Max, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Multiple collimator apparatus with angularly adjustable collimator tubes. 4,200,803, Cl. 250-505.000.

Beckmann, Klaus, to Gewerkschaft Eisenhutte Westfalia. Mineral mining installation. 4,200,338, Cl. 299-43.000.

Becton, Dickinson and Company: *See*—
Reese, Max G., 4,200,625, Cl. 424-1.000.

Bedford, Donald B.: *See*—
Alfrey, Clarence P.; and Bedford, Donald B., 4,200,613, Cl. 422-71.000.

Beecham Group Limited: *See*—
Buckle, Derek R.; and Smith, Harry, 4,200,577, Cl. 424-281.000.
Goudie, Alexander C., 4,200,645, Cl. 424-274.000.
Rogers, Norman H., 4,200,635, Cl. 424-248.570.

Beehler, Richard F.: *See*—
Anderson, Richard M.; and Beehler, Richard F., 4,200,117, Cl. 137-512.100.

Beelitz, Howard R.; and Preslar, Donald R., to RCA Corporation. Method of integrating semiconductor components. 4,199,860, Cl. 29-577.00C.

Beer, Robert W.: *See*—
Meuschke, Robert E.; and Beer, Robert W., 4,199,857, Cl. 29-157.400.

Behringwerke Aktiengesellschaft: *See*—
Helting, Torsten B., 4,200,627, Cl. 424-92.000.

Beine, Burkhard; Ostendorf, Hermann; and Schmidt, Gunter, to Siempelkamp Giesserei GmbH & Co. System for monitoring the mechanical parameters of a pressure vessel. 4,199,994, Cl. 73-785.000.

Bekefi, George; and Orzechowski, Thaddeus J., to Massachusetts Institute of Technology. Relativistic electron beam crossed-field device. 4,200,821, Cl. 315-39.510.

Bell & Howell Company: *See*—
Bowman, Ronald, 4,199,980, Cl. 73-141.00A.
Flint, John R., 4,200,224, Cl. 371-18.000.

Bell Telephone Laboratories, Incorporated: *See*—
Joy, David C.; and Schmidt, Paul H., 4,200,555, Cl. 252-521.000.

Bellomo, Pierfranco: *See*—
Brufani, Mario; Marchi, Egidio; Bellomo, Pierfranco; and Mascellani, Giuseppe, 4,200,573, Cl. 260-239.30P.

Belokin, Paul, Jr. Portable and nestable storage bin. 4,200,346, Cl. 312-351.000.

Ben-Amotz, Ami: *See*—
Avron, Mordhay; and Ben-Amotz, Ami, 4,199,895, Cl. 47-1.400.

Benasutti, Roger: *See*—
Koenig, Thomas A.; and Benasutti, Roger, 4,200,903, Cl. 362-134.000.

Benditalia S.p.A.: *See*—
Cadeddu, Leonardo, 4,199,949, Cl. 60-589.000.

Bendix Corporation, The: *See*—
Kytta, Oswald O., 4,200,001, Cl. 74-478.000.
Wilson, Robert K.; and Ewald, Jerome T., 4,199,946, Cl. 60-547.00B.

Bendoni, Leonard V.; and Fischer, Richard V., to Polaroid Corporation. Transparency film processor. 4,200,383, Cl. 354-304.000.

Beneke, Wolfgang: *See*—
Leifeld, Ferdinand; Beneke, Wolfgang; and Trutzschler, Hermann, 4,199,843, Cl. 19-240.000.

Bengt Petersson New Products Investment AB: *See*—
Hagelberg, Gabriella, 4,200,189, Cl. 206-313.000.

Bennett, Richard C. Set of torque-balanced golf clubs. 4,200,286, Cl. 273-77.00A.

Benson, Harry, III. Space game. 4,200,293, Cl. 273-260.000.

Bepex Corporation: *See*—
Williams, Norman E., 4,200,241, Cl. 241-52.000.

Berchtold, Ernst, to Sulzer Brothers Limited. Internal combustion piston engine. 4,200,066, Cl. 123-41.310.

Berendt, Hans-Ulrich: *See*—
Berger, Alfred; and Berendt, Hans-Ulrich, 4,200,585, Cl. 260-458.00R.

Berezin, Evgeny N.: *See*—
Vydrin, Vladimir N.; Berezin, Evgeny N.; Tischenko, Oleg I.; Dremin, Vladimir G.; and Koval, Grigory I., 4,199,970, Cl. 72-186.000.

Berezuk, Peter D.: *See*—
Wolinski, Leon E.; and Berezuk, Peter D., 4,200,480, Cl. 156-294.000.

Berg, Charles A., to Owens-Illinois, Inc. Modular solar powered heat pump. 4,199,952, Cl. 62-2.000.

Berger, Alfred; and Berendt, Hans-Ulrich, to Ciba-Geigy Corporation. Acid esters of propylene oxide poly-adducts. 4,200,585, Cl. 260-458.00R.

Bergeron, Camille F. Feather removing apparatus and method. 4,199,842, Cl. 17-47.000.

Bergman, Lee H.: *See*—
Panek, Edward J.; Moll, Werner O.; Bergman, Lee H.; and Kersten, Siegfried P., 4,200,501, Cl. 203-7.000.

Bergmann, Konrad: *See—*
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.

Berndt, Gerhard; Kapell, Gerhard; Schummer, Anton; and Hansen, Uwe J., to Norddeutsche Affinerie. Furnace for the melting and refining of copper. 4,200,265, Cl. 266-212.000.

Berney, Jean-Claude, to Ebauches SA. Electronic timepiece with mixed time setting. 4,199,932, Cl. 368-80.000.

Bertazzoni, Guido: *See—*
Biglione, Gianfranco; Bertazzoni, Guido; and Alvares, Antonio, 4,200,696, Cl. 521-58.000.

Bertelson, Robert C. 4-Disubstituted amino, N-substituted naphthalimide dyestuffs. 4,200,752, Cl. 546-100.000.

Bertheussen, Harry: *See—*
Oberg, Karl-Erik; and Bertheussen, Harry, 4,200,458, Cl. 75-129.000.

Berwick, Clinton L.: *See—*
Helmig, Richard W.; and Berwick, Clinton L., 4,200,016, Cl. 83-88.000.

Besik, Ferdinand. Apparatus for renovation of sanitary waters. 4,200,534, Cl. 210-195.300.

Beyer, Douglas E.: *See—*
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,200,718, Cl. 526-173.000.

Bianchi, Nereo, to Necchi Societa per Azioni. Thread cutting device for lockstitch sewing machines. 4,200,050, Cl. 112-292.000.

Bianco, Romolo P. Bolted annular locking collar for a shaft. 4,200,407, Cl. 403-261.000.

Biglione, Gianfranco; Bertazzoni, Guido; and Alvares, Antonio, to Montedison S.p.A. Process for preparing expandible particles of styrene-based polymers. 4,200,696, Cl. 521-58.000.

Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., to Corning Glass Works. Method of densifying metal oxides. 4,200,445, Cl. 65-18.000.

Binger, Bernhard; and Engstler, Anton, to Zahnradfabrik Friedrichshafen AG. Reversible gear pump with invariant flow direction. 4,200,427, Cl. 418-32.000.

Binns, Kenneth J.; and Woolley, Ronald W., to University of Southampton, The. Magnetic disc stores. 4,200,344, Cl. 308-9.000.

Biospherics Incorporated: *See—*
Levin, Gilbert V., 4,200,524, Cl. 210-5.000.

Biro, Katalin: *See—*
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.

Bischoff, William F., to Foster Wheeler Energy Corporation. Regeneration apparatus for producing sulfur dioxide. 4,199,872, Cl. 34-79.000.

Bish, James R.: *See—*
Matter, Robert C.; and Bish, James R., 4,200,143, Cl. 164-440.000.

Bitting, James L.; and Tubb, Thomas L., Jr., to Ethyl Corporation. Cable stripping method. 4,199,854, Cl. 29-426.500.

Black, Adam R.; and Timlin, James J., to Personal Products Company. Increasing absorbent capacity of sanitary napkin by sealing cover material to repellent barrier. 4,200,103, Cl. 128-290.00W.

Blake, Duane, to Warren's Turf Nursery. Apparatus for cutting and collecting grass clippings. 4,199,923, Cl. 56-14.500.

Blessing, Hubert, to Levi Strauss & Co. Method for automatic stitching. 4,200,049, Cl. 112-262.300.

Blinne, Gerd; and Cordes, Claus, to BASF Aktiengesellschaft. Manufacture of polyethers from bisphenols and dihalides in the absence of solvent and in the presence of alkali metal carbonate. 4,200,727, Cl. 528-125.000.

Blinne, Gerd; and Cordes, Claus, to BASF Aktiengesellschaft. Manufacture of polyethers from bis-(4-hydroxyphenyl)-sulfone and bis-(4-chlorophenyl)-sulfone in N-methylpyrrolidone using an alkali metal carbonate as catalysts. 4,200,728, Cl. 528-174.000.

Blom, Hendrik, to U.S. Philips Corporation. Television camera circuit comprising a gamma and an aperture correction circuit. 4,200,888, Cl. 358-162.000.

Blount, David H. Process for the production of polyester silicate plastics. 4,200,697, Cl. 521-83.000.

Bobren, Allan J., to Swingline, Inc. Adjustable magazine for fastener driving tool. 4,200,214, Cl. 227-109.000.

Bock, Siegfried: *See—*
Munz, Wolf-Dieter; Bock, Siegfried; and Potzlberger, Hans W., 4,200,502, Cl. 204-15.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Riegger, Hubertus, 4,199,988, Cl. 73-422.0GC.

Bodnar, Michael, to Furnas Electric Company. Pressure responsive switch with low pressure cutoff. 4,200,775, Cl. 200-83.00S.

Boeing Company, The: *See—*
Cowan, Samuel J.; Gerend, Robert P.; Ramsay, James W.; and Shivashankara, Belur N., 4,199,936, Cl. 60-226.00R.
Haslund, Ralph L., 4,200,819, Cl. 313-148.000.

Boettcher, Carl E., to AIMAC, Inc. Transfer conveyor for elongated workpieces. 4,200,186, Cl. 198-800.000.

Bollag, Werner; and Reber, Kurt, to Hoffmann-La Roche Inc. Vitamin A compositions to treat rheumatic disease. 4,200,647, Cl. 424-305.000.

Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,199,963, Cl. 64-28.00R.
van der Lely, Ary; and Bom, Cornelis J. G., 4,200,156, Cl. 172-59.000.

Bomar, Lucien C., II: *See—*
Roeder, Robert S.; and Bomar, Lucien C., II, 4,200,871, Cl. 343-7.400.

Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, to GAF Corporation. Economical method of making high-strength glass fiber mats particularly useful for roofing products. 4,200,487, Cl. 162-135.000.

Boring, Douglas J., to Conair, Inc. Material loading device. 4,200,415, Cl. 406-173.000.

Borjesson, Jan; and Eriksson, Bertil, to Aktiebolaget Bofors. Device for a sight. 4,200,251, Cl. 244-3.130.

Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, to AGFA-Gevaert, A.G. Motion picture camera. 4,200,364, Cl. 352-141.000.

Borugian, Dennis A.; and Baltare, Gunnar, to Eaton Corporation. Cam and anchor pin spacer arrangement for a brake assembly. 4,200,174, Cl. 188-329.000.

Borzcik, Paul S.; and Hesford, Frank W., to Cincinnati Milacron Inc. Asynchronous bidirectional direct serial interface linking a programmable machine function controller and a numerical control. 4,200,936, Cl. 364-900.000.

Bosboom, Wim: *See—*
Van Schaik, Gerrit P. J.; and Bosboom, Wim, 4,200,813, Cl. 307-300.000.

Bosenberg, Wolfram A.: *See—*
Kleinknecht, Hans P.; and Bosenberg, Wolfram A., 4,200,396, Cl. 356-384.000.

Bosley, Thurston N., to Jemar, Inc. Magnetic game apparatus. 4,200,289, Cl. 273-109.000.

Bottini, Emilio; and Mazzer, Giacomo. Bullet-proof composite material mouldable into flat and curved plates or into hollow bodies of complex shape. 4,200,677, Cl. 428-246.000.

Botts, John C.: *See—*
Ruffing, Charles R.; Gause, Smith A.; Botts, John C.; and Smith, Harry E., 4,200,818, Cl. 310-214.000.

Bourgeois, Claudine: *See—*
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.

Bouvaist, Jean: *See—*
Dubost, Bruno; and Bouvaist, Jean, 4,200,476, Cl. 148-12.70A.

Bovio, Michele; and Castellano, Pietro, to Ing. C. Olivetti & C., S.p.A. Electric keyboard of snap-contact type. 4,200,778, Cl. 200-159.00B.

Bowler, Lauren L., to General Motors Corporation. Engine fuel injection control apparatus with simultaneous pulse width and frequency adjustment. 4,200,063, Cl. 123-32.0EF.

Bowman, Miles A., Jr.; and Schaeffer, Jack A., to Dana Corporation. Integral swing arm. 4,200,165, Cl. 180-253.000.

Bowman, Ronald, to Bell & Howell Company. Folded beam structure utilization methods and apparatus. 4,199,980, Cl. 73-141.00A.

Boyle, Daniel J., to Champion International Corporation. Easy opening, recloseable blister card container. 4,200,193, Cl. 206-461.000.

Brachthauser, Karl-Heinz: *See—*
Kaimann, Walter; and Brachthauser, Karl-Heinz, 4,200,438, Cl. 48-73.000.

Brackett, Raymond B.: *See—*
Page, Robert E.; and Brackett, Raymond B., 4,200,919, Cl. 365-230.000.

Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., to UOP Inc. Hydrometallurgical recovery of metal values. 4,200,455, Cl. 75-91.000.

Bradley, Clark F.: *See—*
Evans, David J.; and Bradley, Clark F., 4,200,859, Cl. 367-1.000.
Evans, David J.; and Bradley, Clark F., 4,200,920, Cl. 367-1.000.

Bradshaw, Janice: *See—*
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,200,746, Cl. 544-25.000.

Brandelli, Anthony R. Ball-type faucet. 4,200,123, Cl. 137-625.400.

Brandes, Lewis H.: *See—*
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,200,445, Cl. 65-18.000.

Brandes, Wilhelm: *See—*
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,200,643, Cl. 42^{d} 272.000.

Brandon, Craig A.: *See—*
Gaddis, Joseph L.; Brandon, Craig A.; and Todd, Donald K., 4,200,533, Cl. 210-195.200.

Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., to International Paper Company. Viscous dispersion for forming wet-laid, non-woven fabrics. 4,200,488, Cl. 162-101.000.

Braque, Gerard: *See—*
Bauer, Daniel; Beck, Jean-Paul; and Braque, Gerard, 4,200,204, Cl. 222-133.000.

Bratoljic, Tihomir, to BBC Brown Boveri & Company Limited. Δ-Connected, two-layer, three-phase winding for an electrical machine. 4,200,817, Cl. 310-198.000.

Brauning, Egon, to Protoned B.V. Adjustable chair. 4,200,332, Cl. 297-300.000.

Bremer, Robert C., Jr., to Wallace Murray Corporation. Zero slip torsional vibration damper. 4,200,004, Cl. 74-574.000.

Briar Industries, Inc.: *See—*
Briar, Jack E., 4,200,236, Cl. 239-532.000.

Briar, Jack E., to Briar Industries, Inc. Mobile water jet sweep cleaner. 4,200,236, Cl. 239-532.000.

Bricker, Daniel W.: *See—*
Shaffer, John W.; Bricker, Daniel W.; and Audesse, Emery G., 4,200,901, Cl. 362-5.000.

Bridgend Processes Limited: *See—*
Gabbitas, Colin, 4,200,870, Cl. 343-5.0PD.

Bridgestone Tire Company Limited: *See—*
Takigawa, Hiroyoshi; and Yahagi, Mitsuhisa, 4,200,134, Cl. 152-209.00R.

Brigand, Gerard; Kragen, Horst; and Rizzotti, Robert, to Societe CECA S.A. Gelling compositions for food products. 4,200,661, Cl. 426-573.000.

Briner, Clifton; and Alexander, George, to American Standard Inc. Chimney top assembly. 4,200,038, Cl. 98-84.000.

Bristol-Myers Company: *See—*
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,200,578, Cl. 548-193.000.
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,200,760, Cl. 548-342.000.

British Aerospace: *See—*
Rowarth, Ralph, 4,200,253, Cl. 244-219.000.

Bro, Per, to P. R. Mallory & Co. Inc. High rate discharge primary battery. 4,200,684, Cl. 429-51.000.

Broemer, Heinz; Huber, Werner; and Meinert, Norbert, to Ernst Leitz Wetzlar GmbH. Zirconium-containing borosilicate glasses. 4,200,467, Cl. 106-47.00Q.

Bronner, Wilhelm: *See—*
Burghardt, Wolfgang; and Bronner, Wilhelm, 4,200,471, Cl. 134-22.00R.

Bronshtein, Lev M.: *See—*
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Brown, Boveri & Cie Aktiengesellschaft: *See—*
Hausler, Michael; and Sadek, Kadry, 4,200,907, Cl. 363-35.000.

Brown, George R.; Carroll, Joseph C.; and Dubuisson, Sidney E., to Texaco Inc. Submerged offshore storage facility. 4,200,411, Cl. 405-210.000.

Brufani, Mario; Marchi, Egidio; Bellomo, Pierfranco; and Mascellani, Giuseppe, to Alfa Farmaceutici, S.p.A. Derivatives of 3-carboxyrifamycin S and SV and process for their preparation. 4,200,573, Cl. 260-239.30P.

Brunswick Corporation: *See—*
Puryear, John W., 4,200,248, Cl. 242-84.51A.

Brussing, Bernd: *See—*
Zeischegg, Walter; and Brussing, Bernd, 4,200,194, Cl. 206-507.000.

Bublki, Grigory I.: *See—*
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Buckle, Derek R.; and Smith, Harry, to Beecham Group Limited. Coumarin derivatives. 4,200,577, Cl. 424-281.000.

Buckley, Bruce S., to Massachusetts Institute of Technology. Apparatus and method whereby wave energy is correlated with positional relationships in a system. 4,200,921, Cl. 367-87.000.

Buckley, Richard D.: *See—*
Gorton, William S., Jr.; and Buckley, Richard D., 4,199,862, Cl. 29-605.000.

Buckman, John B.; and Lykes, Robert E., to A. O. Smith Corporation. Method of making an end play control assembly. 4,199,861, Cl. 29-598.000.

Buddenhagen, Uwe, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method for preventing undesirable heat losses in a cooling system for liquid-cooled vehicular internal-combustion engines. 4,200,065, Cl. 123-41.540.

Budzich, Tadeusz. Load responsive system pump controls. 4,199,944, Cl. 60-445.000.

Budzich, Tadeusz. Load responsive control valve. 4,200,118, Cl. 137-596.130.

Buege, John A.; Hickey, Michael E.; and Rautela, Gopal S., to Du Pont de Nemours, E. I., and Company. Method for isolating MB creatine kinase. 4,200,691, Cl. 435-17.000.

Buehl, Arnold L., to Econoray Inc. Dolly-type heating device with heater section adjustability. 4,200,085, Cl. 126-9.00B.

Buettner, Franz: *See—*
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.

Buffalo Weaving and Belting Co.: *See—*
Johnson, Charles E., 4,200,325, Cl. 294-74.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,200,432, Cl. 8-10.200.

Bugbee, Stanley W.: *See—*
Keondjian, Hagop; and Bugbee, Stanley W., 4,200,365, Cl. 353-29.000.

Bugnone, Aldo. Web feeding or winding-up apparatus. 4,200,245, Cl. 242-64.000.

Bunda, Tsuchio: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, 4,200,552, Cl. 252-466.0PT.

Bunker Ramo Corporation: *See—*
Stupay, Lawrence J., 4,200,348, Cl. 339-61.00R.

Burchmore, William A.: *See—*
Ardell, William E.; Burchmore, William A.; Drolet, Leo P.; and Drolet, Michel, 4,200,479, Cl. 156-154.000.

Burgess, John R.: *See—*
Newberry, Sierling P.; and Burgess, John R., 4,200,794, Cl. 250-396.0ML.

Burghardt, Wolfgang; and Bronner, Wilhelm, to Hoechst Aktiengesellschaft. Process for cleaning spinnerets. 4,200,471, Cl. 134-22.00R.

Burnham, John W.; and Tiner, Robert L., to Halliburton Company. Fracturing compositions and method of preparing and using the same. 4,200,539, Cl. 252-8.55R.

Burnham, John W., to Halliburton Company. Method for fracturing subterranean formations. 4,200,540, Cl. 252-8.55R.

Burough, Irvin G., to Andros Incorporated. Gas analyzer and gas analyzing method. 4,200,791, Cl. 250-343.000.

Burroughs Corporation: *See—*
Rawlings, Robert L.; and Mathews, Ronald D., 4,200,930, Cl. 364-200.000.

Burton, Gordon. Electromagnetic bond photocopy device. 4,200,891, Cl. 358-301.000.

Burton, Robert S., III, to Occidental Oil Shale, Inc. Means for providing gas seal in production level drift for in situ oil shale retort. 4,200,336, Cl. 299-2.000.

Burzin, Klaus: *See—*
Horlbeck, Gernot; and Burzin, Klaus, 4,200,732, Cl. 528-274.000.

Byrd, Norman R., to McDonnell Douglas Corporation. Ozone removal filter containing manganese dioxide and ceric oxide catalysts. 4,200,609, Cl. 422-122.000.

C. B. Fleet Company Incorporated: *See—*
Hobbs, Thomas G., Jr.; and Stephens, Eugene A., 4,200,097, Cl. 128-251.000.

C. Itoh Fashion System Co., Ltd.: *See—*
Akiyama, Tatehito, 4,199,877, Cl. 35-28.300.

C. van der Lely N.V.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,199,963, Cl. 64-28.00R.
van der Lely, Ary; and Bom, Cornelis J. G., 4,200,156, Cl. 172-59.000.

Cadeddu, Leonardo, to Benditalia S.p.A. Hydraulic master cylinder. 4,199,949, Cl. 60-589.000.

Cain, Gerald D.; Dilley, James E.; and Morling, Richard C. S., to National Research Development Corporation. Method and apparatus for averaging and stretching periodic signals. 4,200,810, Cl. 307-221.00D.

Cain, Steve B. Orthodontic spring appliance and assembly. 4,199,865, Cl. 433-21.000.

Calbo, Leonard J., to King Industries, Inc. Curing amino resins with aromatic sulfonic acid oxa-azacyclopentane adducts. 4,200,729, Cl. 525-398.000.

Calusio, Joseph C., to Lehman H. Feeder & Plow, Inc. Timing circuit for game feeder. 4,200,826, Cl. 318-484.000.

Camp, Nat. Steam-air inhalator. 4,200,093, Cl. 128-200.140.

Campbell, David C.; and Thompson, David R., to Pico Electronics Limited. Appliance control. 4,200,862, Cl. 340-310.00A.

Campbell, John A. L.: *See—*
Moynihan, Daniel J.; and Campbell, John A. L., 4,200,335, Cl. 299-1.000.

Campbell Soup Company: *See—*
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,200,041, Cl. 99-483.000.

Canfield, V. Robert: *See—*
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,200,487, Cl. 162-135.000.

Canon Kabushiki Kaisha: *See—*
Aizawa, Hiroshi; Uchidoi, Masanori; Nakamura, Zenzo; and Takishima, Yoshiyuki, 4,200,370, Cl. 354-33.000.
Iwama, Hideto; and Toyama, Masamichi, 4,200,372, Cl. 354-43.000.
Nozaki, Mineo; Asakura, Osamu; and Seki, Mitsuaki, 4,200,043, Cl. 101-93.290.
Sato, Yasuhisa; Tsuji, Sadahiko; Ishikawa, Kazuo; and Matsumura, Susumu, 4,200,380, Cl. 354-219.000.
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,200,374, Cl. 354-60.00R.
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.
Takashima, Matsuo, 4,200,858, Cl. 367-135.000.
Tsuji, Sadahiko; and Sato, Yasuhisa, 4,200,358, Cl. 350-184.000.

Cape, Arthur T. Ferrous base alloy for hard facing. 4,200,457, Cl. 75-122.000.

Caponigro, Dennis A.; and Lopez, Eugene F., to Raychem Corporation. Method for joining heat-recoverable sheet material and resulting article. 4,200,676, Cl. 428-57.000.

Cappel, Bert: *See—*
Schramm, Peter; Schuhmann, Siegfried; Schoneberger, Edgar F.; Dorn, Alfred; and Cappel, Bert, 4,200,932, Cl. 364-519.000.

Carborundum Company, The: *See—*
Shoup, Gary L.; and Grier, Jack B., 4,199,904, Cl. 51-423.000.

Carlesimo, John. Adjustable seal member for conduit to manhole junction. 4,200,299, Cl. 277-101.000.

Carley, Joseph C.; and Ippolito, Anthony C., to Wurlitzer Company, The. Envelope control causing damper effect on percussive voices of electronic musical instrument. 4,200,022, Cl. 84-1.260.

Carli, Natalino: *See—*
Malvano, Renato; Omini, Marco; and Carli, Natalino, 4,200,361, Cl. 350-336.000.

Carlson, David E., to RCA Corporation. Amorphous silicon Schottky barrier solar cells incorporating a thin insulating layer and a thin doped layer. 4,200,473, Cl. 136-89.0SJ.

Carlsson, Kaj, to Konetehdas Maskinfabrik Norcar Ky Kb. Drawbar for a trailer. 4,200,315, Cl. 280-492.000.

Carney, John F., III, to State of Connecticut. Energy absorbing system. 4,200,310, Cl. 280-784.000.

Carnt, Peter S.; Rutishauser, Ernst A. O.; and Schiess, Jorg, to RCA Corporation. Encoding and transcoding apparatus for video disc systems. 4,200,881, Cl. 358-4.000.

Carroll, Joseph C.: *See—*
Brown, George R.; Carroll, Joseph C.; and Dubuisson, Sidney E., 4,200,411, Cl. 405-210.000.

Carsky, Milan: *See—*
Vagac, Svetozar; Prochazka, Bretislav; Mueller, Jiri; Kostka, Anton; and Carsky, Milan, 4,200,486, Cl. 162-8.000.

Carson, William M., to CLS Industries, Inc. Fiber optic elevation sensing apparatus. 4,200,787, Cl. 250-227.000.

Carter, Larry D.; and Clark, Silas W., to Roldiva, Inc. Method and apparatus for continuously freezing and melting a fluid mixture. 4,199,961, Cl. 62-535.000.

Carter, William W., to Sybron Corporation. Combination process sensor. 4,200,834, Cl. 324-450.000.

Cascio, Horace E.: *See—*
Walker, Elijah C.; and Cascio, Horace E., 4,200,806, Cl. 250-577.000.

Casper, Clemens: *See—*
Wingler, Frank; Casper, Clemens; and Liebig, Lothar, 4,200,713, Cl. 526-64.000.

Cass, George. Harmonograph. 4,199,867, Cl. 33-27.00L.

Cassella, Vincent J.; and Irani, Mazin R., to PQ Corporation. Treating chrome tanning bath recycle stream. 4,200,527, Cl. 210-49.000.

Cassella, Vincent J.; and Irani, Mazin R., to PQ Corporation. Removing metal ions from aqueous effluents. 4,200,528, Cl. 210-49.000.

Cast-Tec Ltd.: *See—*
Pluim, Cornelius, 4,200,139, Cl. 164-72.000.

Castanie, Francis: *See—*
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,200,935, Cl. 364-717.000.

Castellano, Pietro: *See—*
Bovio, Michele; and Castellano, Pietro, 4,200,778, Cl. 200-159.00B.

Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,200,072, Cl. 123-139.0AP.
Herr, Charles H., Jr.; and McLees, Alan L., 4,199,979, Cl. 73-134.000.

Cathers, William P.; and Dorn, Charles W., Jr., to PPG Industries, Inc. Frame having rotating orienting members. 4,200,420, Cl. 414-107.000.

Cavil, David T.; and Krueger, William R., to Outboard Marine Corporation. C. D. ignition system with active pulse discriminating means. 4,200,078, Cl. 123-148.0CC.

Ceccon, Claude R.: *See—*
Bauers, William R.; Mioduski, Paul; and Ceccon, Claude R., 4,199,987, Cl. 73-379.000.

Celanese Corporation: *See—*
Slinkard, William E.; Baylis, Anthony B.; and Hughes, Michael P., 4,200,764, Cl. 562-549.000.

CEM Compagnie Electro-Mecanique: *See—*
Delassus, Jean, 4,200,141, Cl. 164-147.000.

Centre de Recherche Fondamentale "Rivieren" S.P.R.L.: *See—*
Willot, Henri A., 4,200,442, Cl. 55-222.000.

Cerdan, Jean-Pierre: *See—*
Marjollet, Jacques; Tondeur, Gerard; Cerdan, Jean-Pierre; and Talleu, Patrick, 4,200,443, Cl. 55-347.000.

CF Industries, Inc.: *See—*
Johansen, Richard W., 4,200,616, Cl. 422-169.000.

Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., to Arthur G. McKee & Company. Treatment of hydrocarbon-containing mineral material. 4,200,517, Cl. 208-11.00R.

Champion International Corporation: *See—*
Boyle, Daniel J., 4,200,193, Cl. 206-461.000.
Faller, Rudolph A., 4,200,481, Cl. 156-382.000.
Goiden, Ronald, 4,200,730, Cl. 525-398.000.
Webinger, George, 4,200,188, Cl. 206-45.140.

Chang, Irving B., to Allied Chemical Corporation. Stable, compatible thixotropic gel with copolymer gelling agent. 4,200,561, Cl. 260-23.00H.

Chappell, Terry I.; and White, Richard M., to University of California, The Regents of the. Solar power system and high efficiency photovoltaic cells used therein. 4,200,472, Cl. 136-89.0PC.

Charvin, Guy. Device for introducing a liquid other than blood in a blood vessel. 4,200,096, Cl. 128-214.400.

Chase, Charles R.; and Lantry, Gerald F. Shower attachable dispenser. 4,200,206, Cl. 222-144.500.

Chatterjee, Pronoy K.; and Schwenker, Robert F., Jr., to Personal Products Company. Absorbent product including grafted insolubilized cellulose ether. 4,200,557, Cl. 260-17.00A.

Chellel, William A.: *See—*
Ayers, Lewis W.; and Chellel, William A., 4,199,852, Cl. 29-239.000.

Chem-Pro Equipment Corp.: *See—*
Karr, Andrew E., 4,200,525, Cl. 210-21.000.

CHEM-Y, Fabriek van chemische produkten B.V.: *See—*
Dorrepaal, Wim; and van den Haak, Gerardus M., 4,200,522, Cl. 209-166.000.

Chemische Werke Huls A.G.: *See—*
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, 4,200,703, Cl. 525-357.000.
Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, 4,200,725, Cl. 528-49.000.
Horlbeck, Gernot; and Burzin, Klaus, 4,200,732, Cl. 528-274.000.
Peterlein, Karl; Schulde, Felix; Diedrich, Klaus M.; and Kulisch, Volker W., 4,200,559, Cl. 260-17.4ST.
Scharf, Helmut, 4,200,589, Cl. 260-593.00R.

Chen, Chia-Ming. Organic phenol extract compositions of peanut hull agricultural residues and method. 4,200,723, Cl. 528-1.000.

Chernov, Boris P.: *See—*
Koshevoi, Anatoly A.; Kanaikin, Mikhail M.; Lapy, Viktor J.; and Chernov, Boris P., 4,199,874, Cl. 35-10.400.

Chevron Research Company: *See—*
Liston, Thomas V.; and Lowe, Warren, 4,200,543, Cl. 252-32.70E.
Mulvany, Paul K., 4,200,518, Cl. 208-48.0AA.
Singer, Malcolm S., 4,200,450, Cl. 71-106.000.

Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, to Konishiroku Photo Industry Co., Ltd. Antistatic light-sensitive silver halide photographic element. 4,200,465, Cl. 430-527.000.

Chibana, Masanobu, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instruments which form musical tones by repeatedly generating musical tone waveform elements. 4,200,021, Cl. 84-1.220.

Chinquapin Corporation: *See—*
West, Allen D., 4,200,198, Cl. 220-269.000.

Chiriac, Ilie: *See—*
Teodorescu, Constantin; Chiriac, Ilie; Sava, Cornel D.; Draghici, Adrian; and Zinca, Sabin, 4,200,425, Cl. 417-178.000.

Chitwood, Ernest L.; and Jones, Max E. Device for carrying golf clubs. 4,200,131, Cl. 150-1.50R.

Cholnoky, Eszter: *See—*
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.

Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., to Rohm and Haas Company. Flocs for filtration and deionization prepared from cationic and anionic emulsion ion exchange resins. 4,200,695, Cl. 521-28.000.

Chore-Time Equipment, Inc.: *See—*
Van Daele, Antoine, 4,200,060, Cl. 119-56.00R.

Christensen, Inc.: *See—*
Peschel, Eberhard; Rathkamp, Hermann; Katzorke, Klaus; and Jurgens, Rainer, 4,200,159, Cl. 175-329.000.

Chu, David Y. Writing implements. 4,200,403, Cl. 401-6.000.

Chugai Seiyaku Kabushiki Kaisha: *See—*
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Ciba-Geigy Corporation: *See—*
Berger, Alfred; and Berendt, Hans-Ulrich, 4,200,585, Cl. 260-458.00R.
Darms, Roland; and Wyler, Siegfried, 4,200,724, Cl. 528-26.000.
Tlach, Hugo; Leifels, Klaus-Dieter; and Mischler, Werner, 4,200,489, Cl. 162-162.000.
Vogel, Christian; and Aebi, Rudolf, 4,200,451, Cl. 71-118.000.

Cincinnati Milacron Inc.: *See—*
Borzcik, Paul S.; and Hesford, Frank W., 4,200,936, Cl. 364-900.000.

Citizen Watch Co. Ltd.: *See—*
Yokoyama, Akira, 4,199,931, Cl. 368-318.000.

Clark Equipment Company: *See—*
Schmidt, Donald K.; and Kuhn, Patrick, 4,200,255, Cl. 248-289.00A.

Clark, Silas W.: *See—*
Carter, Larry D.; and Clark, Silas W., 4,199,961, Cl. 62-535.000.

Clarke, Peter A., to Molins Limited. Conveyor systems for cigarettes and similar rod-like articles. 4,200,181, Cl. 198-572.000.

Clason, Donald L.; Pindar, John F.; and Cohen, Jerome M., to Lubrizol Corporation, The. Amino phenol-detergent/dispersant combinations and fuels and lubricants containing same. 4,200,545, Cl. 252-33.400.

Clatworthy, Edward F.: *See—*
Smith, Darrell F., Jr.; Tipton, David G.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., 4,200,459, Cl. 75-170.000.

Claudius Peters AG: *See—*
Knorr, Gunter, 4,200,047, Cl. 110-281.000.

Claxton, George P.: *See—*
Grisar, J. Martin; and Claxton, George P., 4,200,755, Cl. 546-199.000.

Clayman, Ralph V. Person and blood identification wrist band. 4,199,882, Cl. 40-21.00C.

Clement, Jean-Claude: *See—*
Sturtz, Georges; and Clement, Jean-Claude, 4,200,594, Cl. 260-944.000.

Clemson University: *See—*
Hood, Clarence E.; McHugh, Carl M.; and Hawkins, Fletcher G., 4,199,913, Cl. 53-244.000.

Cleveland, Joseph J.: *See—*
Dziedzic, Chester J.; Kleiner, Richard N.; and Cleveland, Joseph J., 4,200,604, Cl. 264-101.000.

CLS Industries, Inc.: *See—*
Carson, William M., 4,200,787, Cl. 250-227.000.

Coal Industry (Patents) Limited: *See—*
Robinson, Joseph G.; and Herbert, Lesley D., 4,200,556, Cl. 260-3.000.

Cochran, Michael J.; and Vandierendonck, Jerry L., to Texas Instruments Incorporated. Electronic calculator implemented in semicon-

ductor LSI chips with scanned keyboard and display. 4,200,926, Cl. 364-200.000.
Cockman, Euliss C., Jr. Safety interlock system for a school bus door or the like. 4,200,167, Cl. 180-281.000.
Cocksedge, John A. Handle attachment for containers. 4,200,323, Cl. 294-33.000.
Cocron, Istvan: *See*—
Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,200,364, Cl. 352-141.000.
Coffin, Louis F., Jr.: *See*—
Armijo, Joseph S.; and Coffin, Louis F., Jr., 4,200,492, Cl. 176-82.000.
Cohen, Jerome M.: *See*—
Clason, Donald L.; Pindar, John F.; and Cohen, Jerome M., 4,200,545, Cl. 252-33.400.
Cohen, Louis, to B. F. Goodrich Company, The. Coating polymerization reactors with oligomer coatings derived from reaction products of substituted phenols. 4,200,712, Cl. 526-62.000.
Cohen, Shlomo; Gollop, Zeev; and Klein, Levi, to Dead Sea Bromine Company Ltd. Method for fumigating grain including the application of liquid CO_2. 4,200,656, Cl. 426-331.000.
Colburn, Samuel E.; and Mauck, James W., to National Distillers and Chemical Corporation. Turbine mixer. 4,200,614, Cl. 422-134.000.
Cole, Francis X.: *See*—
Root, David M.; and Cole, Francis X., 4,200,690, Cl. 435-7.000.
College Research Corporation: *See*—
Evans, Marvin; and Miller, David H., 4,200,262, Cl. 266-44.000.
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., to Rod Pierce and Associates. Machine having module with carriage for advancing row of articles. 4,200,201, Cl 221-129.000.
Combustion Engineering, Inc.: *See*—
Pope, Kenneth E., 4,200,516, Cl. 204-302.000.
Rider, Jerald R., 4,200,203, Cl. 222-14.000.
Compagnie Francaise de Raffinage: *See*—
Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., 4,200,623, Cl. 423-644.000.
Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., 4,200,624, Cl. 423-644.000.
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.
Compton, Dennis N.: *See*—
Lichliter, William L.; and Compton, Dennis N., 4,200,339, Cl. 300-21.000.
Conair, Inc.: *See*—
Boring, Douglas J., 4,200,415, Cl. 406-173.000.
Peterson, Russell I., Jr., 4,200,243, Cl. 241-224.000.
Connor, Peter J., to Mosser Industries, Inc. Closure apparatus with snap-in seal strips. 4,199,898, Cl. 49-92.000.
Conoco, Inc.: *See*—
Starks, Charles M., 4,200,706, Cl. 525-502.000.
Construction Specialties, Inc.: *See*—
Bartlett, Gary F., 4,200,261, Cl. 256-59.000.
Continental Group, Inc., The: *See*—
Klootwyk, Ronald I.; and Pagendarm, Lawrence J., 4,200,685, Cl. 429-70.000.
Control Data Corporation: *See*—
Newberry, Sterling P.; and Burgess, John R., 4,200,794, Cl. 250-396.0ML.
Conwed Corporation: *See*—
Koenig, Thomas A.; and Benasutti, Roger, 4,200,903, Cl. 362-134.000.
Cook, James S. Low air flow fumigation method. 4,200,657, Cl. 426-419.000.
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, to Glaxo Laboratories, Ltd. Cephalosporins. 4,200,746, Cl. 544-25.000.
Cook, Norman E.; and Kirby, William L. Automatic starting system. 4,200,080, Cl. 123-179.0BG.
Cooper, Herbert. Snap-closing container. 4,200,319, Cl. 294-1.0BA.
Copal Company Limited: *See*—
Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,200,375, Cl. 354-50.000.
Cordes, Claus: *See*—
Blinne, Gerd; and Cordes, Claus, 4,200,727, Cl. 528-125.000.
Blinne, Gerd; and Cordes, Claus, 4,200,728, Cl. 528-174.000.
Corning Glass Works: *See*—
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,200,445, Cl. 65-18.000.
Ohls, James W., 4,200,136, Cl. 164-6.000.
Cotton Incorporated: *See*—
Winch, Allen R., 4,199,966, Cl. 68-22.00R.
Couch, Terry L.: *See*—
Stein, Robert G.; Couch, Terry L.; and Michaels, Raymond J., 4,200,654, Cl. 424-330.000.
Courbot, Pierre, to Societe Anonyme DBA. Clutch assembly. 4,200,176, Cl. 192-89.00B.
Cowan, Samuel J.; Gerend, Robert P.; Ramsay, James W.; and Shivashankara, Belur N., to Boeing Company, The. Gas turbine engine combustion noise suppressor. 4,199,936, Cl. 60-226.00R.
Cox, Malcolm; and Singer, Irwin, to University of Pennsylvania. Inhibition of ADH-stimulated osmotic water flow and aldosterone-stimulated sodium transport. 4,200,630, Cl. 424-227.000.
Cox, Michael G. C., to Wilkinson Sword Limited. Method for the manufacture of matches. 4,200,437, Cl. 44-42.000.
Coyle, Forrest E.: *See*—
Albaric, Jacques E.; Coyle, Forrest E.; and Sherlock, Thomas P., 4,200,784, Cl. 219-470.000.
Crabere, Henri: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,200,935, Cl. 364-717.000.
Crafton, Richard F.; and Goldberg, Lawrence. System for producing decorative plates for photoprinting. 4,200,462, Cl. 430-494.000.
Craig, John R.: *See*—
Craig, R. Colin; and Craig, John R., 4,199,927, Cl. 56-314.000.
Craig, R. Colin; and Craig, John R. Combine reel weed shield. 4,199,927, Cl. 56-314.000.
Crane, Herbert R., to Hobart Corporation. Scraper blade structure for meat cleaning machine. 4,199,840, Cl. 17-16.000.
Cremer, Heinz P.; and Werner, Paul, to Keiper Automobiltechnik GmbH & Co. KG. Adjustable hinge mount for a seatback. 4,200,333, Cl. 297-362.000.
Crenshaw, Ronnie R.: *See*—
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,200,578, Cl. 548-193.000.
Algieri, Aldo A.; and Crenshaw, Ronnie R., 4,200,760, Cl. 548-342.000.
Cristaldi, Lucian M., to Du Pont de Nemours, E. I., and Company. Tow splicing apparatus. 4,199,928, Cl. 57-22.000.
Crompton & Knowles Corporation: *See*—
Steiner, Russell I., 4,200,570, Cl. 260-163.000.
Croomes, Edgar F.; and Murfree, James A., to United States of America, Army. Detector for fumes of hydrazine and its derivatives. 4,200,608, Cl. 422-97.000.
Cross, Carroll N. Display mount. 4,199,883, Cl. 40-152.100.
Cruccu, Antonio, to Industria Macchine Impianti. Process for the production of large glass containers. 4,200,447, Cl. 65-76.000.
Csoka, Frank S., to Fun Things, Inc. Game device. 4,200,290, Cl. 273-139.000.
Cunningham, Patrick J. Adjustable fluid flow restrictor. 4,200,119, Cl. 137-605.000.
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, The. Systems for controlling the position of a moored floating vessel. 4,200,052, Cl. 114-230.000.
Currier, George T. Foot-operated control device. 4,200,025, Cl. 84-422.00R.
Cushman, David W.: *See*—
Ondetti, Miguel A.; and Cushman, David W., 4,200,649, Cl. 424-309.000.
Cushman, Glenn F., to Northrop Corporation. Inertial instrument with a multiplexed rebalance network. 4,200,925, Cl. 364-107.000.
Custers, Adrianus C. W.: *See*—
de Jong, Nicolaas J.; and Custers, Adrianus C. W., 4,200,853, Cl. 336-192.000.
Czako, Charles A.: *See*—
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,200,517, Cl. 208-11.00R.
Czerepinski, Ralph G.: *See*—
Garrett, Walter L.; and Czerepinski, Ralph G., 4,200,688, Cl. 430-302.000.
Dabkowski, Michael J.: *See*—
Stein, Thomas R.; Heck, Roland H.; and Dabkowski, Michael J., 4,200,521, Cl. 208-216.0PP.
Dach, Hansjorg, to Zahnradfabrik Friedrichshafen AG. Hydraulic actuating system for a pair of concurrently operating friction devices for the selection of speeds of a load-shiftable transmission. 4,200,008, Cl. 74-869.000.
Dai, Sheng-Hong A., to Upjohn Company, The. Benzoic acid ester derivative. 4,200,763, Cl. 560-109.000.
Daicel Ltd.: *See*—
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,200,726, Cl. 528-99.000.
Kubo, Masyoshi; Nakanishi, Michio; and Watanabe, Shoji, 4,200,560, Cl. 260-22.0EP.
Daiken Kogyo Co., Ltd.: *See*—
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, 4,199,958, Cl. 62-374.000.
Daikin Plant Co., Ltd.: *See*—
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, 4,199,958, Cl. 62-374.000.
Dailey, Robert C.: *See*—
Dailey, Thomas C.; and Dailey, Robert C., 4,200,260, Cl. 256-24.000.
Dailey, Thomas C.; and Dailey, Robert C. Picket fence structure. 4,200,260, Cl. 256-24.000.
Daimler-Benz Aktiengesellschaft: *See*—
Hilpert, Wolfgang; Komander, Gerhard; and Stotz, Manfred, 4,199,977, Cl. 73-119.00A.
Merkle, Josef, 4,200,270, Cl. 267-65.00B.
Meyer, Franz-Josef, 4,199,934, Cl. 60-39.230.
Dana Corporation: *See*—
Bowman, Miles A., Jr.; and Schaeffer, Jack A., 4,200,165, Cl. 180-253.000.
Dansky, Barry: *See*—
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, 4,200,804, Cl. 250-506.000.
Darlington, Jack, to Petter Power Generation Limited. Engine oil pressure operated system. 4,200,079, Cl. 123-179.00G.

Darms, Roland; and Wyler, Siegfried, to Ciba-Geigy Corporation. Polymer containing imidyl groups and silyl groups. 4,200,724, Cl. 528-26.000.

Das Gupta, Arun-Kumar; and Seidl, Franz, to Motoren- und Turbinen-Union Munchen GmbH. Device for maintaining gas turbine engines, more particularly gas turbine jet engines. 4,200,273, Cl. 269-61.000.

Data General Corporation: *See*—
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, 4,200,894, Cl. 360-106.000.

Date, Nobuaki: *See*—
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,200,374, Cl. 354-60.00R.

Datta, Amitava; Miller, Clarence L., Jr.; and Shilling, Jack W., to Allegheny Ludlum Industries, Inc. Processing for electromagnetic silicon steel. 4,200,477, Cl. 148-113.000.

Daugherty, Lenn: *See*—
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, 4,200,894, Cl. 360-106.000.

Davidjuk, Alexandr D.; Koshevoi, Anatoliy A.; Lapy, Viktor J.; and Frankov, Vasily N. Input device for delivery of data from digital transmitters. 4,200,929, Cl. 364-200.000.

Davidson, Peter J.: *See*—
Hignett, Rosemary R.; and Davidson, Peter J., 4,200,591, Cl. 260-604.0HF.
Hignett, Rosemary R.; and Davidson, Peter J., 4,200,592, Cl. 260-604.0HF.

Davis, Charles J.: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,200,488, Cl. 162-101.000.

Davis, Hubert G.: *See*—
Welter, Charles R.; Liss, Barry; Davis, Hubert G.; and Albright, Charles W., 4,200,494, Cl. 201-9.000.

Davis, Rhetta Q., to Dow Chemical Company, The. Process for preparing blends of vinyl esters and reactive diluents. 4,200,705, Cl. 525-482.000.

Davis, Walter H. Stabilized trolling planer. 4,199,891, Cl. 43-43.130.

Davy Powergas, Inc.: *See*—
Bailey, Edgar E.; Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,200,619, Cl. 423-242.000.

Dawley, Robert E. Ground leakage current interrupter. 4,200,897, Cl. 361-45.000.

Day, Donald L.; and Steinberg, Marvin P. Electrochemical conversion of organic material. 4,200,505, Cl. 204-149.000.

Dead Sea Bromine Company Ltd.: *See*—
Cohen, Shlomo; Gollop, Zeev; and Klein, Levi, 4,200,656, Cl. 426-331.000.

Deckert, Rosalie E. Pill cutter. 4,199,863, Cl. 30-124.000.

de Jong, Nicolaas J.; and Custers, Adrianus C. W., to U.S. Philips Corporation. Transformer with single turn U-shaped winding. 4,200,853, Cl. 336-192.000.

Delassus, Jean, to CEM Compagnie Electro-Mecanique. Electromagnetic inductor ingot mold for continuous casting. 4,200,141, Cl. 164-147.000.

DeLaurentis, Angelo A.; Zola, Frank G., Jr.; and Specht, Theodore R., to Westinghouse Electric Corp. Core with step-lap joints. 4,200,854, Cl. 336-217.000.

Delbar Products, Inc.: *See*—
O'Connell, Lawrence E.; and Nichols, George F., 4,200,510, Cl. 204-192.00R.

Del Conte, Maria L. Contraceptive intrauterine device. 4,200,091, Cl. 128-130.000.

Delmar Chemicals, Limited: *See*—
Dickinson, Robert A., 4,200,759, Cl. 548-324.000.

Denniston, George C., Jr., to Ketchum Laboratories Inc. Reversible vasectomy device and method. 4,200,088, Cl. 128-1.00R.

Denroche, Charles H. P.: *See*—
Agnew, Kenneth M.; Denroche, Charles H. P.; and Hewlett, Roy, 4,200,404, Cl. 402-22.000.

Dentsply Research & Development Corp.: *See*—
Gonser, Donald I., 4,200,105, Cl. 128-303.140.

Denzinger, Walter; Schenck, Hans-Uwe; and Schwarz, Wolfgang, to BASF Aktiengesellschaft. Preparation of polyvinylpyrrolidone-iodine. 4,200,710, Cl. 525-356.000.

DePaoli, Alan G.: *See*—
Richards, John S.; and DePaoli, Alan G., 4,200,369, Cl. 354-7.000.

de Rosnay, Arnaud L. G., to International Promotion Public Relation Establishment. Sail-propelled land vehicle. 4,200,302, Cl. 280-1.000.

Desai, Natvarlal B., to Grillo-Werke Aktiengesellschaft; and Ludwig Taprogge Reinigungsanlagen fur Rohrenwarmeaustauscher. Method of preventing the adhesion of scale to the heating surfaces of a thermal desalination apparatus. 4,200,500, Cl. 203-7.000.

Deuring, Albert. Guns. 4,199,886, Cl. 42-44.000.

Devereux, Eileen. Portable toilet combination. 4,199,826, Cl. 4-116.000.

DeZotell, Gary L.: *See*—
Hubach, Richard A.; DeZotell, Gary L.; and Sacks, Jack, 4,200,861, Cl. 340-146.30Q.

Diamond Shamrock Corporation: *See*—
Muehlenbrock, Dale R.; Prihoda, John R.; and Singleton, Leonard, Jr., 4,200,734, Cl. 528-503.000.

Dick, Heinrich, to Voith Getriebe KG. Control device for a motor vehicle clutch. 4,200,175, Cl. 192-0.033.

Dickinson, George A., to Pilkington Brothers Limited. Glass manufacture. 4,200,448, Cl. 65-134.000.

Dickinson, Robert A., to Delmar Chemicals, Limited. Preparation of imidazo[2,1-a]isoindole compounds. 4,200,759, Cl. 548-324.000.

Dictaphone Corporation: *See*—
Matison, Gary G., 4,200,893, Cl. 360-72.100.

di Donato, Jose J. Toss and tumble toy. 4,200,288, Cl. 273-428.000.

Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, to Chemische Werke Huls A.G. Process for the manufacture of heat-stable, nuclear-brominated polystyrenes. 4,200,703, Cl. 525-357.000.

Diedrich, Klaus M.: *See*—
Peterlein, Karl; Schulde, Felix; Diedrich, Klaus M.; and Kulisch, Volker W., 4,200,559, Cl. 260-17.4ST.

Diesel Kiki Company, Ltd.: *See*—
Takahashi, Kenji; Kumagai, Takasuke; and Takaichi, Kazuyoshi, 4,200,075, Cl. 123-140.0FG.

Diessel, Paul: *See*—
Perner, Johannes; Greif, Norbert; Fikentscher, Rolf; and Diessel, Paul, 4,200,733, Cl. 528-417.000.

Dietrichs, Hans-Hermann: *See*—
Puls, Jurgen; Sinner, Michael; and Dietrichs, Hans-Hermann, 4,200,692, Cl. 435-99.000.

Diffie, Bailey W.: *See*—
Hellman, Martin E.; Diffie, Bailey W.; and Merkle, Ralph C., 4,200,770, Cl. 178-22.000.

Dilley, James E.: *See*—
Cain, Gerald D.; Dilley, James E.; and Morling, Richard C. S., 4,200,810, Cl. 307-221.00D.

Dillmann, Gerhard: *See*—
Maurer, Helmut; Linder, Ernst; and Dillmann, Gerhard, 4,200,071, Cl. 123-124.00R.

Dinello, Julio G., to United States Steel Corporation. Pressure relieving coke oven door. 4,200,498, Cl. 202-248.000.

Dinkelkamp, Henry T.: *See*—
Douvas, Nicholas G.; and Dinkelkamp, Henry T., 4,200,106, Cl. 128-305.000.

Distler, Harry; and Goetze, Walter, to BASF Aktiengesellschaft. Preparation of α-hydroxy-β,β-dimethyl-γ-butyrolactone. 4,200,582, Cl. 260-343.600.

Diversified Products Corporation: *See*—
James, Forrest H., Jr.; and Silberman, Ira J., 4,199,912, Cl. 53-127.000.

Dixon Automatic Tool, Inc.: *See*—
Dixon, Paul H., 4,200,180, Cl. 198-487.000.

Dixon, Paul H., to Dixon Automatic Tool, Inc. Mechanism for feeding workpieces. 4,200,180, Cl. 198-487.000.

Doan, Duc. Solar powered street lighting system. 4,200,904, Cl. 362-183.000.

Dodwell & Company Limited: *See*—
Kobayashi, Shozaburo; and Yamauchi, Kenji, 4,199,983, Cl. 73-302.000.

Doguchi, Nobushige: *See*—
Hirono, Hatsuo; Nagata, Katsuyuki; and Doguchi, Nobushige, 4,200,503, Cl. 204-38.00A.

Doherty, Thomas E., to Owens-Illinois, Inc. Apparatus for applying plastic sleeves to glass bottles. 4,199,851, Cl. 29-235.000.

Doi, Yasuhiko: *See*—
Matsui, Toshio; Doi, Yasuhiko; and Nakamura, Yasuo, 4,200,389, Cl. 355-3.0FU.

Dormehl, Erich, to Heyligenstaedt & Comp., Werkzeugmaschinenfabrik GmbH. Workpiece changing mechanisms for lathes. 4,200,014, Cl. 82-2.700.

Dorn, Alfred: *See*—
Schramm, Peter; Schuhmann, Siegfried; Schoneberger, Edgar F.; Dorn, Alfred; and Cappel, Bert, 4,200,932, Cl. 364-519.000.

Dorn, Charles W., Jr.: *See*—
Cathers, William P.; and Dorn, Charles W., Jr., 4,200,420, Cl. 414-107.000.

Dorrepaal, Wim; and van den Haak, Gerardus M., to CHEM-Y, Fabriek van chemische produkten B.V. Process for the flotation of ores. 4,200,522, Cl. 209-166.000.

Douglas, George H.: *See*—
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,200,648, Cl. 424-308.000.

Douglas, Lawrence M., to Polaroid Corporation. Projector. 4,200,367, Cl. 353-78.000.

Douvas, Nicholas G.; and Dinkelkamp, Henry T. Fixed arc cyclic ophthalmic surgical instrument. 4,200,106, Cl. 128-305.000.

Dow Chemical Company, The: *See*—
Davis, Rhetta Q., 4,200,705, Cl. 525-482.000.
Evani, Syamalarao; and Raymond, Russell J., 4,200,720, Cl. 526-233.000.
Flagg, Edward E., 4,200,749, Cl. 544-221.000.
Garrett, Walter L.; and Czerepinski, Ralph G., 4,200,688, Cl. 430-302.000.
Krajewski, Richard M.; and Erickson, Robert E., 4,200,671, Cl. 427-154.000.
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,200,718, Cl. 526-173.000.

Doyle, Richard: *See*—
Novak, Raymond F.; Doyle, Richard; and Frank, Edmund, 4,200,215, Cl. 227-123.000.

Draber, Wilfried: *See*—
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,200,643, Cl. 424-272.000.

Dragerwerk Aktiengesellschaft: *See*—
Warncke, Ernst; and Pasternack, Adalbert, 4,200,092, Cl. 128-202.260.

Draghici, Adrian: *See—*
Teodorescu, Constantin; Chiriac, Ilie; Sava, Cornel D.; Draghici, Adrian; and Zinca, Sabin, 4,200,425, Cl. 417-178.000.
Drake, Charles A., to Phillips Petroleum Company. Inhibiting the carbon-carbon double bond isomerization of substituted or unsubstituted hydrocarbon compounds. 4,200,586, Cl. 260-464.000.
Dremin, Vladimir G.: *See—*
Vydrin, Vladimir N.; Berezin, Evgeny N.; Tischenko, Oleg I.; Dremin, Vladimir G.; and Koval, Grigory I., 4,199,970, Cl. 72-186.000.
Dreschhoff, Gisela A. M.; and Zeller, Edward J. Process for providing identification markings for gemstones. 4,200,506, Cl. 204-157.10H.
Dresser Industries, Inc.: *See—*
Farrow, James T.; Vanderford, William D.; and Taylor, Ernest E., 4,199,856, Cl. 29-454.000.
Highsmith, Albert E., 4,200,343, Cl. 308-8.200.
Driga, Mircea D.: *See—*
Weldon, William F.; Driga, Mircea D.; and Woodson, Herbert H., 4,200,831, Cl. 322-8.000.
Drobish, James L., to Procter & Gamble Company, The. Vaginal contraceptive and method of using. 4,200,090, Cl. 128-127.000.
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Droz, Jean-Claude: *See—*
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,199,930, Cl. 368-252.000.
Drury, Frederick H., to Weatherford Oil Tool Co., Ltd. Dental amalgamation apparatus. 4,199,866, Cl. 366-139.000.
DSO "Cherna Metalurgia": *See—*
Savov, Peter H.; Peev, Vassil G.; Valchev, Alexander Y.; and Lingorski, Nikola A., 4,200,452, Cl. 75-12.000.
Dubost, Bruno; and Bouvaist, Jean, to Societe de Vente de l'Aluminium Pechiney. Process for the thermal treatment of thick products made of copper-containing aluminum alloys of the 7000 series. 4,200,476, Cl. 148-12.70A.
Dubuisson, Sidney E.: *See—*
Brown, George R.; Carroll, Joseph C.; and Dubuisson, Sidney E., 4,200,411, Cl. 405-210.000.
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Dugois, Jean-Pierre: *See—*
Morel, Paul; and Dugois, Jean-Pierre, 4,200,513, Cl. 204-243.00M.
Duhamel, Ernest; and Poirier, Fernando. Baby hygienic receptor. 4,200,102, Cl. 128-286.000.
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Dunleavy, Daniel W. Leaf bagging equipment and method. 4,200,127, Cl. 141-10.000.
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Novak, Raymond F.; Doyle, Richard; and Frank, Edmund, 4,200,215, Cl. 227-123.000.
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Balmat, Jean L., 4,200,523, Cl. 210-4.000.
Buege, John A.; Hickey, Michael E.; and Rautela, Gopal S., 4,200,691, Cl. 435-17.000.
Cristaldi, Lucian M., 4,199,928, Cl. 57-22.000.
FitzGerald, Emerson B.; and Meyer, Walter C., 4,200,566, Cl. 260-37.00N.
Lauder, Alan, 4,200,554, Cl. 252-474.000.
Richardson, Paul N., 4,200,707, Cl. 525-2.000.
Durham, Henry B. Contact lens applicator. 4,200,320, Cl. 294-1.0CA.
Durselen, Hans J., to Trutzschler GmbH & Co. KG. Draw cutter. 4,200,020, Cl. 83-643.000.
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Dye, S. Owen, to ACF Industries, Inc. Carburetor. 4,200,595, Cl. 261-39.00B.
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Steele, James R., 4,200,412, Cl. 406-22.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Trautvetter, Werner; and Weisgerber, Gregor, 4,200,568, Cl. 260-42.470.
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Olson, John R., 4,200,146, Cl. 165-39.000.
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E-C Apparatus Corporation: *See—*
Gorman, William W., Jr.; and Gorman, Esther M., 4,200,611, Cl. 422-258.000.
E. et M. Lamort: *See—*
Lamort, Jean P. J., 4,200,537, Cl. 210-415.000.
E. R. Squibb & Sons, Inc.: *See—*
Ondetti, Miguel A.; and Cushman, David W., 4,200,649, Cl. 424-309.000.
Eaton Corporation: *See—*
Borugian, Dennis A.; and Baltare, Gunnar, 4,200,174, Cl. 188-329.000.
Dummer, Merlin R., 4,200,781, Cl. 200-340.000.
Hopkins, Gary L., 4,200,816, Cl. 310-168.000.
Kasper, Leslie J., 4,199,942, Cl. 60-420.000.
Kintner, Paul M., 4,200,914, Cl. 364-900.00B.
Meyer, Lawrence L.; Mueller, Robert S.; and Walsh, Michael M., 4,200,081, Cl. 123-198.00F.
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Oehlke, Donald N., 4,200,027, Cl. 85-36.000.
Stratynski, Eugene; and Zukausky, Keith, 4,200,124, Cl. 137-885.000.
Ebauches SA: *See—*
Berney, Jean-Claude, 4,199,932, Cl. 368-80.000.
Ebeling, Wilfried: *See—*
Raffel, Reiner; Hauptmann, Gunter; Reffelmann, Gerd; and Ebeling, Wilfried, 4,200,603, Cl. 264-51.000.
Econoray Inc.: *See—*
Buehl, Arnold L., 4,200,085, Cl. 126-9.00B.
Edward, John C., to J B Development Corporation. Hardness testing apparatus. 4,199,976, Cl. 73-81.000.
Efimenko, Ljubov A.: *See—*
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, to Nippon Soken, Inc. Non-linear operational circuit. 4,200,843, Cl. 328-142.000.
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, to Hoechst Aktiengesellschaft. Decontamination of wet-processed phosphoric acid. 4,200,620, Cl. 423-321.00S.
Ehret, Boyd P. Apparatus for collecting and thermally storing energy. 4,200,783, Cl. 219-365.000.
Ehrlinger, Friedrich; and Ott, Anton, to Zahnradfabrik Friedrichshafen AG. Gear-change transmission with differential. 4,200,006, Cl. 74-681.000.
Eilerman, Robert G.: *See—*
Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., 4,200,659, Cl. 426-534.000.
Eimco (Great Britain) Limited: *See—*
Hunt, William A., 4,199,943, Cl. 60-430.000.
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., to Ardal og Sunndal Verk a.s. Method for teem-welding metals. 4,200,140, Cl. 164-105.000.
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Hatzinicolaides, John A.; and Papamantellos, Demetrios C., 4,200,453, Cl. 75-52.000.
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, to VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen. Tensioning and safety apparatus for conveyor chain of row-crop harvester. 4,199,924, Cl. 56-98.000.
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Ball, Russell M., 4,200,491, Cl. 176-19.00R.
Stein, Thomas R.; Heck, Roland H.; and Dabkowski, Michael J., 4,200,521, Cl. 208-216.0PP.
Elektrokemiska Aktiebolaget: *See—*
Sunden, Olof; Johansson, Hans; Ahlberg, Hakan B.; and Karlsson, Per-Arne I., 4,200,548, Cl. 252-135.000.
Eli Lilly and Company: *See—*
Katner, Allen S., 4,200,745, Cl. 544-21.000.
Elliston, Thomas L. Stabilized hoist rig for deep ocean mining vessel. 4,200,054, Cl. 114-264.000.
Elser, Dieter, to Zahnradfabrik Friedrichshafen AG. Servo steering gear. 4,200,030, Cl. 91-375.00A.
Emerson Electric Co.: *See—*
Milum, Jimmy L., 4,200,909, Cl. 363-144.000.
Emigh, Arthur W., Jr.: *See—*
Ward, Donald D.; and Emigh, Arthur W., Jr., 4,199,871, Cl. 34-25.000.
Engel, John F., to FMC Corporation. Arylthiovinylcyclopropanecarboxylate insecticides. 4,200,644, Cl. 424-274.000.
Engel, Zbigniew; Kepinski, Marek; and Grabowski, Idzi, to Osredek Badawczo-Rozwojowy Maszyn Hutniczych. Tube swaging machine. 4,199,969, Cl. 72-76.000.
Engele, Horst, to Fabbrica Italiana Magneti Marelli S.p.A. Electronic apparatus for feed control of air-gasoline mixture in internal combustion engines. 4,200,064, Cl. 123-32.0EB.
Engelhard Minerals & Chemicals Corporation: *See—*
Pitts, Frank, 4,200,618, Cl. 423-163.000.
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Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., 4,200,623, Cl. 423-644.000.
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Engineering Components Limited: *See—*
Witchell, Stanley P., 4,200,444, Cl. 55-484.000.
Engstler, Anton: *See—*
Binger, Bernhard; and Engstler, Anton, 4,200,427, Cl. 418-32.000.
Enya, Takeshi: *See—*
Murakami, Fumio; Enya, Takeshi; and Ochiai, Yoshinori, 4,200,796, Cl. 250-402.000.

Epifano, Leonard: *See*—
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Erdmann, Wolf-Dieter: *See*—
Musmann, Hans-Georg; and Erdmann, Wolf-Dieter, 4,200,886, Cl. 358-135.000.
Erickson, Robert E.: *See*—
Krajewski, Richard M.; and Erickson, Robert E., 4,200,671, Cl. 427-154.000.
Eriksson, Bertil: *See*—
Borjesson, Jan; and Eriksson, Bertil, 4,200,251, Cl. 244-3.130.
Erlichman, Irving, to Polaroid Corporation. Exposure control system including blade sensing follow focus and trim arrangement. 4,200,379, Cl. 354-196.000.
Ernst Leitz Wetzlar GmbH: *See*—
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,200,467, Cl. 106-47.00Q.
Holle, Werner, 4,200,786, Cl. 250-204.000.
Erwin Sick GmbH Optik-Elektronik: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,200,397, Cl. 356-429.000.
ESB Incorporated: *See*—
Oughton, George W.; and Smollinger, Glenn J., 4,200,830, Cl. 320-32.000.
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, to Robert Bosch GmbH. Apparatus for synchronizing the driving and driven members during gear shift operations. 4,200,007, Cl. 74-859.000.
Estradier, Francoise: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,200,432, Cl. 8-10.200.
Ethyl Corporation: *See*—
Bitting, James L.; and Tubb, Thomas L., Jr., 4,199,854, Cl. 29-426.500.
Eubank, Marcus P. Trailer assembly for carrying overwidth loads. 4,200,305, Cl. 280-404.000.
Euteco S.p.A.: *See*—
Piras, Giancarlo, 4,200,226, Cl. 371-9.000.
Evak Sanitar AB: *See*—
Hellers, Bo G., 4,199,828, Cl. 4-321.000.
Evani, Syamalarao; and Raymond, Russell J., to Dow Chemical Company, The. Process for the preparation of low molecular weight anhydride interpolymers. 4,200,720, Cl. 526-233.000.
Evans, Alfred C.; and Smilgys, Bruno S., to Veeder Industries Inc. Pulse generator unit for fuel pump register. 4,200,785, Cl. 235-92.0FL.
Evans, Anthony C.; Goering, Karl; and Rinker, Kurt H., to Kelsey-Hayes Company. Sliding caliper disc brake. 4,200,173, Cl. 188-73.300.
Evans, David D.: *See*—
Huff, Roger K.; Evans, David D.; and Anderson, Nicholas H., 4,200,653, Cl. 424-322.000.
Evans, David J.; and Bradley, Clark F., to United States of America, Navy. Device for simulating marine craft noises. 4,200,859, Cl. 367-1.000.
Evans, David J.; and Bradley, Clark F., to United States of America, Navy. Artificial underwater target. 4,200,920, Cl. 367-1.000.
Evans, Marvin; and Miller, David H., to College Research Corporation. Method and apparatus for removing combustible material from metal scrap. 4,200,262, Cl. 266-44.000.
Evans Products Company: *See*—
Hassenauer, Robert L., 4,200,208, Cl. 222-505.000.
Everett/Charles, Inc.: *See*—
Long, Everett J.; and Muench, Elmer W., 4,200,351, Cl. 339-108.0TP.
Ewald, Jerome T.: *See*—
Wilson, Robert K.; and Ewald, Jerome T., 4,199,946, Cl. 60-547.00B.
Ex-Cell-O Corporation: *See*—
Fitzpatrick, Paul, 4,199,903, Cl. 51-339.000.
Excel Industries, Inc.: *See*—
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,200,155, Cl. 172-14.000.
Exxon Research & Engineering Co.: *See*—
Gladrow, Elroy M.; and Winter, William E., 4,200,520, Cl. 208-120.000.
Lang, Robert J., 4,200,439, Cl. 48-210.000.
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, to Richter Gedeon Vegyeszeti Gyar Rt. Treating mammalian subject sensitive to indomethacin ulcerogenisis. 4,200,631, Cl. 424-232.000.
F. L. Smidth & Co.: *See*—
Touborg, Jorn, 4,200,469. Cl. 106-100.000.
Fabbrica Italiana Magneti Marelli S.p.A.: *See*—
Engele, Horst, 4,200,064, Cl. 123-32.0EB.
Facet Enterprises, Inc.: *See*—
Miller, Donald L., 4,200,003, Cl. 74-574.000.
Fairchild Camera and Instrument Corporation: *See*—
Holland, Richard W., 4,200,349, Cl. 339-75.0MP.
Falcon Safety Products, Inc.: *See*—
Vall, Seymour, 4,200,053, Cl. 114-230.000.
Fall, Herbert S.: *See*—
Fall, Martin K., 4,200,342, Cl. 308-3.800.
Fall, Martin K., to Fall, Herbert S. Combination solid bearing and ball bearing slide. 4,200,342, Cl. 308-3.800.
Faller, Rudolph A., to Champion International Corporation. Apparatus for making a lined tray. 4,200,481, Cl. 156-382.000.
Fanger, Hans-Ulrich; Pepelnik, Rudolf; and Michaelis, Walfried, to Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH. Method of and apparatus for ascertaining the volume components of a three-component mixture. 4,200,792, Cl. 250-359.000.
Fannin, Wayne V.: *See*—
Gute, Loren R.; and Fannin, Wayne V., 4,200,318, Cl. 293-136.000.
Farah, Alfred E.; and Gorman, William G., to Sterling Drug Inc. Benzyl alcohol virucidal process. 4,200,655, Cl. 424-343.000.
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, to Medi-Ray, Inc. System for transporting, storing and injecting radioisotope-containing fluids. 4,200,804, Cl. 250-506.000.
Farham, Sutton B.: *See*—
Goldman, Theodore D.; and Farham, Sutton B., 4,200,567, Cl. 260-40.00R.
Farina, Attilio; and Zappala, Giuseppe, to Indesit Industria Elettrodomestici Italiana S.p.A. Circuit for providing saw-tooth current in a coil. 4,200,824, Cl. 315-408.000.
Farr, Glyn P. R., to Girling Limited. Hydraulic systems. 4,199,941, Cl. 60-413.000.
Farrow, James T.; Vanderford, William D.; and Taylor, Ernest E., to Dresser Industries, Inc. Method of providing lubricant volume displacement system for a rotary rock bit. 4,199,856, Cl. 29-454.000.
Fazis, Harald, to Ludwig Boschert GmbH & Co. KG. Table stop for a cutting machine. 4,200,019, Cl. 83-467.00R.
FBM International, Inc.: *See*—
Peterson, Bertel R., 4,199,918, Cl. 53-537.000.
Federal Paper Board Co., Inc.: *See*—
Ganz, Robert H., 4,200,220, Cl. 229-40.000.
Fein, Hubert, to Firm Josef Frohling. Sectioning apparatus for elongate material. 4,200,017, Cl. 83-333.000.
Feinendegen, Ludwig: *See*—
Becker, Veit; Feinendegen, Ludwig; and Pollermann, Max, 4,200,803, Cl. 250-505.000.
Feldstein, Michael: *See*—
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, 4,200,894, Cl. 360-106.000.
Ferrofluidics Corporation: *See*—
Stahl, Philip; Moskowitz, Ronald; and Reed, Walter R., 4,200,296, Cl. 277-80.000.
Feuer, Erwin P. Greeting card with removable decal. 4,200,222, Cl. 229-92.800.
Feyen, Peter; Preiss, Michael; and Metzger, Karl G., to Bayer Aktiengesellschaft. Beta-lactam antibiotics. 4,200,576, Cl. 424-246.000.
Fiat Societa per Azioni: *See*—
Malvano, Renato; Omini, Marco; and Carli, Natalino, 4,200,361, Cl. 350-336.000.
Fichter, Manfred, to Kienzle Apparate GmbH. Frequency converter delivering constant width output pulses within variable duty cycles. 4,200,812, Cl. 307-265.000.
Field, Nathan D.: *See*—
Marder, Herman L.; Field, Nathan D.; and Shinohara, Makoto, 4,200,737, Cl. 536-87.000.
Shinohara, Makoto; and Field, Nathan D., 4,200,736, Cl. 536-87.000.
Fikentscher, Rolf: *See*—
Perner, Johannes; Greif, Norbert; Fikentscher, Rolf; and Diessel, Paul, 4,200,733, Cl. 528-417.000.
Fink, Eugen; and Krennwallner, Eberhard, to Krauss-Maffei AG. Method of dewatering a slurry. 4,200,529, Cl. 210-73.00R.
Finkelstein, Theodor. Method and device for balanced compounding of Stirling cycle machines. 4,199,945, Cl. 60-520.000.
Firm Josef Frohling: *See*—
Fein, Hubert, 4,200,017, Cl. 83-333.000.
Firmenich & Cie.: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,200,660, Cl. 426-535.000.
Firth, Donald: *See*—
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,200,052, Cl. 114-230.000.
Fischer, Artur. Toy model kit including a solar collector. 4,199,894, Cl. 46-17.000.
Fischer, Karl; and Stebegg, Josef, to U.S. Philips Corporation. Pressure pad support for a cassette. 4,200,250, Cl. 242-199.000.
Fischer, Richard V.: *See*—
Bendoni, Leonard V.; and Fischer, Richard V., 4,200,383, Cl. 354-304.000.
Fischetti, Frank, Jr.: *See*—
Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., 4,200,659, Cl. 426-534.000.
Fisco, Benjamin P., Jr., to Aquatech, Inc. Apparatus for sewer cleaning and the like. 4,199,837, Cl. 15-302.000.
Fish, Elson B., to Plas/Steel Products, Inc. Plastic composite tubular element containing a sleeve of braided metallic ribbons. 4,200,126, Cl. 138-143.000.
Fisher, Michael H.; Lusi, Aino; and Tolman, Richard L., to Merck & Co., Inc. Alkyl derivatives of C-076 compounds. 4,200,581, Cl. 424-180.000.
Fisher, William B.: *See*—
Van Peppen, Jan F.; and Fisher, William B., 4,200,553, Cl. 252-447.000.
Fitch, John L., to Mobil Oil Corporation. Pipelining particulate solid material as stable foam slurry. 4,200,413, Cl. 406-49.000.
FitzGerald, Emerson B.; and Meyer, Walter C., to Du Pont de Nemours, E. I., and Company. Thermoplastic powder coating systems. 4,200,566, Cl. 260-37.00N.

Fitzpatrick, Paul, to Ex-Cell-O Corporation. Expandable abrading tool and abrasive insert thereof. 4,199,903, Cl. 51-339.000.

Flagg, Edward E., to Dow Chemical Company, The. Preparation of halogenated modified isocyanurates. 4,200,749, Cl. 544-221.000.

Flament, Ivon: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,200,660, Cl. 426-535.000.

Flanders, Dale C.: *See*—
Smith, Henry I.; Austin, Stewart S.; and Flanders, Dale C., 4,200,395, Cl. 356-356.000.

Fletcher, Aaron N., to United States of America, Navy. High energy density thermal cell. 4,200,686, Cl. 429-112.000.

Flint, John R., to Bell & Howell Company. Method and system for isolating faults in a microprocessor and a machine controlled by the microprocessor. 4,200,224, Cl. 371-18.000.

Flintoff, John F.: *See*—
Bailey, Edgar E.; Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,200,619, Cl. 423-242.000.

Flor, Lawrence A.; and Kurttila, Kenneth R., to Minnesota Mining and Manufacturing Company. Sheet for titling light-sensitive material. 4,200,675, Cl. 428-43.000.

Flowers, Dervin L., to Motorola, Inc. Semiconductor device manufacture using photoresist protective coating. 4,200,463, Cl. 430-317.000.

Fluehmann, Werner, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Gear train. 4,200,000, Cl. 74-437.000.

FMC Corporation: *See*—
Engel, John F., 4,200,644, Cl. 424-274.000.

Focke & Co.: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,200,221, Cl. 229-44.0CB.

Focke, Heinz; and Liedtke, Kurt, to Focke & Co. Blanks and strips thereof for the folding of flip-top cigarette boxes. 4,200,221, Cl. 229-44.0CB.

Fontaine Industries, Inc.: *See*—
Williams, John B., Jr., 4,200,355, Cl. 350-10.000.

Fontaine, Marc F.: *See*—
Saadeh, Fuad T.; and Fontaine, Marc F., 4,200,150, Cl. 166-231.000.

Forgach, Lilla: *See*—
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.

Forsberg, John W., to Lubrizol Corporation, The. Magnesium-containing greases and method for their preparation. 4,200,544, Cl. 252-33.200.

Fortini, Anthony; and Kazaroff, John M., to United States of America, National Aeronautics and Space Administration. Heat exchanger and method of making. 4,199,937, Cl. 60-267.000.

Forward, Robert L.; and Peterson, Robert W., to Hughes Aircraft Company. Cold damping of mechanical structures. 4,199,989, Cl. 73-430.000.

Foster, John W.; and Jones, Clarence R. Method for enhancing simultaneous fracturing in the creation of a geothermal reservoir. 4,200,152, Cl. 166-271.000.

Foster Wheeler Energy Corporation: *See*—
Bischoff, William F., 4,199,872, Cl. 34-79.000.

Fraley, Jack E.; Sommers, Earl F.; Strang, Shorter; and McConnell, W. C., to United States of America, Interior. Induced air flow self-cleaning spray nozzle. 4,200,232, Cl. 239-112.000.

Francis, Herbert E. Bowling shoe guide device. 4,199,881, Cl. 36-130.000.

Frank, Edmund: *See*—
Novak, Raymond F.; Doyle, Richard; and Frank, Edmund, 4,200,215, Cl. 227-123.000.

Frankel, David S.: *See*—
Knazek, Richard A.; Gullino, Pietro M.; and Frankel, David S., 4,200,689, Cl. 435-2.000.

Frankov, Vasily N.: *See*—
Davidjuk, Alexandr D.; Koshevoi, Anatoly A.; Lapy, Viktor J.; and Frankov, Vasily N., 4,200,929, Cl. 364-200.000.

Free Form, Inc.: *See*—
Vasquez, Orsolina L., 4,199,822, Cl. 2-106.000.

Freeman, Michael H., to Pilkington P. E. Limited. Microform readers. 4,200,366, Cl. 353-78.000.

Frey, Richard H., to Microwave Semiconductor Corp. Microwave transistor with distributed output shunt tuning. 4,200,880, Cl. 357-51.000.

Frey, Russell J. Combination ski boot walker and carrier. 4,199,880, Cl. 36-132.000.

Frick, Alexander; and Frick, Florin, to Frick, Alexander. Animal shelter. 4,200,059, Cl. 119-16.000.

Frick, Florin: *See*—
Frick, Alexander; and Frick, Florin, 4,200,059, Cl. 119-16.000.

Fricker, Hans, to Sulzer Brothers Limited. Method of protecting a pipe. 4,199,853, Cl. 29-415.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Jasch, Erich; and Kasper, Paul, 4,199,906, Cl. 52-63.000.

Friedman, Harvey S., to Polaroid Corporation. Photographic processing roller and a novel method which utilizes a pulsed laser for manufacturing the roller. 4,200,382, Cl. 354-304.000.

Friefeld, Jerome M.; and Silverman, Jacob, to Rockwell International Corporation. Storing and extracting latent heat. 4,200,148, Cl. 165-104.00S.

Fritzinger, George H. Method and apparatus for signalling motorists and pedestrians when the direction of traffic will change. 4,200,860, Cl. 340-43.000.

Fritzsche Dodge & Olcott Inc.: *See*—
Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., 4,200,659, Cl. 426-534.000.

Frode, Per E. L.; and Olsson, Karl B. R., to Nife Jungner AB. Separator. 4,200,687, Cl. 429-130.000.

Fryberger, Steven G.; and Ahlbrandt, Thomas S., to United States of America, Interior. Eolian sand trap. 4,199,974, Cl. 73-28.000.

Frye, Clifton G.: *See*—
Mahoney, John A.; and Frye, Clifton G., 4,200,714, Cl. 526-68.000.

Fugate, Philip E.: *See*—
Roy, Kenneth L.; and Fugate, Philip E., 4,200,401, Cl. 400-124.000.

Fuji Electric Co., Ltd.: *See*—
Anahara, Ryoji; Sato, Koichi; Kaneda, Motoshiro; and Saito, Mitsuo, 4,200,835, Cl. 324-51.000.
Okada, Isamu; and Inoue, Takehito, 4,200,836, Cl. 324-51.000.

Fuji Photo Film Co., Ltd.: *See*—
Sasazawa, Koji; Komine, Shigeo; Kitamoto, Tatsuji; and Akashi, Goro, 4,200,680, Cl. 428-403.000.
Shishido, Tadao; and Arai, Naoki, 4,200,464, Cl. 430-512.000.
Yamagishi, Kiichiro; Hirose, Matutaro; and Muramatsu, Sachio, 4,200,211, Cl. 226-21.000.

Fujii, Kenji, to Yoshida Iron Works Co. Ltd. Method of and member for adding treating agent for molten metal. 4,200,456, Cl. 75-93.00G.

Fujitsu Limited: *See*—
Kiyota, Kohei; Ueda, Hiroo; Kitagawa, Shunji; and Tasai, Kunihiko, 4,200,461, Cl. 430-91.000.

Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, to Konishiroku Photo Industry Co., Ltd. Light-sensitive silver halide photographic materials. 4,200,466, Cl. 430-566.000.

Fun Things, Inc.: *See*—
Csoka, Frank S., 4,200,290, Cl. 273-139.000.

Furnas Electric Company: *See*—
Bodnar, Michael, 4,200,775, Cl. 200-83.00S.

Furuya, Katusuke: *See*—
Miyazaki, Yorizo; and Furuya, Katusuke, 4,199,911, Cl. 53-64.000.

Fuss, Otto. Multiple-use joint connector. 4,200,406, Cl. 403-231.000.

Gabbitas, Colin, to Bridgend Processes Limited. Microwave components. 4,200,870, Cl. 343-5.0PD.

Gaddis, Joseph L.; Brandon, Craig A.; and Todd, Donald K. Hyperfiltration apparatus and method of fluid treatment. 4,200,533, Cl. 210-195.200.

GAF Corporation: *See*—
Bondoc, Alfredo A.; Canfield, V. Robert; and Ziegler, B. Randall, 4,200,487, Cl. 162-135.000.

Galanos, Demosthenes G., to United States of America, Air Force. Apparatus for, and method of, recording and viewing laser-made images on high gain retroreflective sheeting. 4,200,875, Cl. 346-1.100.

Gallus, Julius P., to Union Oil Company of California. Method for cementing high temperature wells. 4,200,153, Cl. 166-292.000.

Ganslmeier, Michael; and Wuenschmann, Horst, to Siemens Aktiengesellschaft. Medical thermometer comprising a digital display device for displaying the temperature value of the body temperature. 4,199,986, Cl. 73-362.0AR.

Ganz, Robert H., to Federal Paper Board Co., Inc. Wrap-around paperboard carrier with latching and locking panels. 4,200,220, Cl. 229-40.000.

Gardner, Denise: *See*—
Meyer, Burton C.; and Gardner, Denise, 4,200,197, Cl. 220-263.000.

Gargini, Eric J. Wired television broadcasting systems. 4,200,839, Cl. 455-3.000.

Garner, Eugene F.: *See*—
Hamilton, Brian K.; Garner, Eugene F.; and Harrell, Terry R., 4,200,615, Cl. 422-166.000.

Garrett, Walter L.; and Czerepinski, Ralph G., to Dow Chemical Company, The. Method of treating image-bearing lithographic plates. 4,200,688, Cl. 430-302.000.

Gates Rubber Company, The: *See*—
Hush, James M.; and McPhee, Donald J., 4,200,125, Cl. 138-126.000.

Gause, Smith A.: *See*—
Ruffing, Charles R.; Gause, Smith A.; Botts, John C.; and Smith, Harry E., 4,200,818, Cl. 310-214.000.

Gausepohl, Hermann; Naarmann, Herbert; Penzien, Klaus; and Stephan, Rudolf, to BASF Aktiengesellschaft. Self-extinguishing thermoplastic molding compositions. 4,200,702, Cl. 525-72.000.

Gautschi, Fritz: *See*—
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,200,660, Cl. 426-535.000.

Gaylord, Norman G.: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,200,664, Cl. 427-4.000.

Gearheart, John D.; and Jenkinson, Frederic W., to Systron-Donner Corporation. Water level recorder. 4,200,876, Cl. 346-49.000.

Gedeon, Andras; Olsson, Sven-Gunnar; and Psaros, Georgios, to Siemens Aktiengesellschaft. Apparatus for warming and moistening a respiration gas. 4,200,094, Cl. 128-201.130.

Gemignani, Francois. Device for sensing pressure and governing the operation of safety valves. 4,200,116, Cl. 137-492.000.

General Atomic Company: *See*—
Porter, John T., II, 4,200,507, Cl. 204-158.00R.

General Electric Company: *See*—
Armijo, Joseph S.; and Coffin, Louis F., Jr., 4,200,492, Cl. 176-82.000.
Grossman, Leonard N.; and Packard, Douglas R., 4,200,460, Cl. 75-177.000.

Hall, Walter L.; and Humphrey, James S., Jr., 4,200,681, Cl. 428-412.000.
Johansson, August V.; and Schneider, Joseph D., 4,200,832, Cl. 322-59.000.
Litch, Ernest W., III, 4,200,257, Cl. 248-604.000.
Pohl, Walter J., 4,200,829, Cl. 318-782.000.
Poling, Ronald W., 4,200,776, Cl. 200-83.00P.
Walker, Dale C., 4,200,345, Cl. 308-36.100.
Yang, Kei-Hsiung; and Kingsley, Jack D., 4,200,790, Cl. 250-315.200.

General Filters, Inc.: *See—*
Yeagle, Richard J., 4,200,598, Cl. 261-92.000.

General Motors Corporation: *See—*
Baldwin, Jack W., 4,200,234, Cl. 239-296.000.
Bowler, Lauren L., 4,200,063, Cl. 123-32.0EF.
Gute, Loren R.; and Fannin, Wayne V., 4,200,318, Cl. 293-136.000.
Irwin, Clarence C.; and Manz, David F., 4,200,308, Cl. 280-804.000.
Kimble, Harry J.; and Roessler, David M., 4,200,399, Cl. 356-437.000.
Knape, Richard S., 4,200,231, Cl. 239-94.000.
Koliba, Melvin J.; and Napel, Larry P., 4,200,046, Cl. 410-94.000.
Mathues, Thomas P.; and Parker, Donald L., 4,199,940, Cl. 60-547.00R.
Mathues, Thomas P.; and Parker, Donald L., 4,199,947, Cl. 60-547.00R.
Mathues, Thomas P.; and Parker, Donald L., 4,199,948, Cl. 60-553.000.
Matter, Robert C.; and Bish, James R., 4,200,143, Cl. 164-440.000.
McClellan, Alan J., 4,199,855, Cl. 29-450.000.
Reid, Kenneth H.; and Ozias, Walter T., Jr., 4,200,311, Cl. 280-801.000.
Stoltman, Donald D., 4,200,073, Cl. 123-139.0AW.
Trenne, Myron U., 4,200,067, Cl. 123-90.120.
Wepler, Manfred, 4,200,327, Cl. 296-15.000.

George, Michael J.: *See—*
Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., 4,200,137, Cl. 164-49.000.

Gerber Garment Technology, Inc.: *See—*
Gerber, Heinz J., 4,200,015, Cl. 83-22.000.

Gerber, Heinz J., to Gerber Garment Technology, Inc. Closed loop method and apparatus for cutting sheet material. 4,200,015, Cl. 83-22.000.

Gerber Products Company: *See—*
Johnson, Earl W.; Reider, Malcolm J.; Anewalt, Robert; and Kring, Harry J., 4,200,526, Cl. 210-23.00H.

Gerding, Charles C., to Jones & Laughlin Steel Corporation. Warp-resistant doorjamb for a coke oven. 4,200,499, Cl. 202-248.000.

Gerend, Robert P.: *See—*
Cowan, Samuel J.; Gerend, Robert P.; Ramsay, James W.; and Shivashankara, Belur N., 4,199,936, Cl. 60-226.00R.

Gerkey, Kenneth S.; and Smith, Edward H., to Westinghouse Electric Corp. Remotely controlled tool positioning table. 4,200,424, Cl. 414-744.000.

Gesellschaft fur Kernenergieverwertung in Schiffbau und Schiffahrt mbH: *See—*
Fanger, Hans-Ulrich; Pepelnik, Rudolf; and Michaelis, Walfried, 4,200,792, Cl. 250-359.000.

Gewerkschaft Eisenhutte Westfalia: *See—*
Beckmann, Klaus, 4,200,338, Cl. 299-43.000.

Gidai, Katalin: *See—*
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.

Gilcher, Heinz, to Westinghouse Air Brake Company. Bolt-like railway vehicle wheel detector. 4,200,855, Cl. 338-5.000.

Gilcher, Heinz, to Westinghouse Air Brake Company. Differential clamp-on railway vehicle wheel detector. 4,200,856, Cl. 338-5.000.

Gillet, Auguste; Gilsoul, Paul; and Malhaize, Emile, to Ateliers de Constructions Electriques de Charleroi (ACEC). Process control plant comprising processing of signals. 4,200,864, Cl. 340-507.000.

Gillette Company, The: *See—*
Lebet, Jean-Philippe; and Droz, Jean-Claude, 4,199,930, Cl. 368-252.000.

Gilsoul, Paul: *See—*
Gillet, Auguste; Gilsoul, Paul; and Malhaize, Emile, 4,200,864, Cl. 340-507.000.

Gindri, Eridiano, to Ing. C. Olivetti & C., S.p.A. Sorting apparatus for reproduction machine producing simplex and duplex copies. 4,200,278, Cl. 271-296.000.

Girling Limited: *See—*
Farr, Glyn P. R., 4,199,941, Cl. 60-413.000.
Margetts, Hugh G., 4,200,340, Cl. 303-6.00A.

Glacier GmbH-Deva Werke: *See—*
Kauschke, Wolfgang, 4,200,341, Cl. 308-3.500.

Gladrow, Elroy M.; and Winter, William E., to Exxon Research & Engineering Co. Catalytic cracking process. 4,200,520, Cl. 208-120.000.

Glass, Howard L., to Rockwell International Corporation. Method of fabricating multiple layer composite. 4,200,484, Cl. 156-622.000.

Glasscock, David E.; and Pearson, Jackie B. Molded polyurethane beehives. 4,199,832, Cl. 6-1.000.

Glassman, Jacob A. Catamenial tampon. 4,200,101, Cl. 128-285.000.

Glaxo Laboratories, Ltd.: *See—*
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,200,746, Cl. 544-25.000.

Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., to SmithKline Corporation. Substituted azetidinones. 4,200,572, Cl. 260-239.00A.

Gliatas, Themistocles H., to Ranco Incorporated. Butterfly valve. 4,200,258, Cl. 251-214.000.

Glock, Hans; and Hartel, Gerhard, to Siemens Aktiengesellschaft. Control circuit for the adaptation of storage cells in bipolar integrated circuits. 4,200,918, Cl. 365-210.000.

Godding, Ronald G., to BCIRA. Holder for irregularly shaped articles. 4,200,272, Cl. 269-26.000.

Goering, Karl: *See—*
Evans, Anthony C.; Goering, Karl; and Rinker, Kurt H., 4,200,173, Cl. 188-73.300.

Goettl, Adam D. Moisture entrainment baffle for evaporative coolers. 4,200,599, Cl. 261-97.000.

Goetz, Richard W., to National Distillers and Chemical Corporation. Glycol aldehyde and ethylene glycol processes. 4,200,765, Cl. 568-862.000.

Goetze, Walter: *See—*
Distler, Harry; and Goetze, Walter, 4,200,582, Cl. 260-343.600.

Goetzinger, David J., to Platt Saco Lowell Limited. Method and means for regulating sliver draft uniformity. 4,199,844, Cl. 19-240.000.

Goko, Nobuaki: *See—*
Abe, Toshizo; Goko, Nobuaki; Nishihara, Yasuhiro; and Matuda, Yukimasa, 4,200,717, Cl. 526-159.000.

Goldberg, Lawrence: *See—*
Crafton, Richard F.; and Goldberg, Lawrence, 4,200,462, Cl. 430-494.000.

Golden, Ronald, to Champion International Corporation. Chemical modification of microscopic opacifying particles. 4,200,730, Cl. 525-398.000.

Goldman, Theodore D.; and Farham, Sutton B., to Rohm and Haas Company. Synergistic impact modifier system for poly (alkylene terephthalates). 4,200,567, Cl. 260-40.00R.

Goldstein, Seth R.: *See—*
Peterson, John I.; and Goldstein, Seth R., 4,200,110, Cl. 128-634.000.

Gollop, Zeev: *See—*
Cohen, Shlomo; Gollop, Zeev; and Klein, Levi, 4,200,656, Cl. 426-331.000.

Gonser, Donald I., to Dentsply Research & Development Corp. Electrosurgical safety circuit. 4,200,105, Cl. 128-303.140.

Goodman, David S.: *See—*
Anhalt, John W.; Goodman, David S.; and Selvin, Gerald J., 4,200,768, Cl. 174-79.000.

Goodwin, Max E., to Marcy Gymnasium Equipment Company. Weight lifting type exercising device. 4,200,280, Cl. 272-118.000.

Goodyear Tire & Rubber Company, The: *See—*
Massey, Fred L.; and Sponseller, Trent A., 4,200,731, Cl. 525-437.000.

Gorman, Esther M.: *See—*
Gorman, William W., Jr.; and Gorman, Esther M., 4,200,611, Cl. 422-258.000.

Gorman, William G.: *See—*
Farah, Alfred E.; and Gorman, William G., 4,200,655, Cl. 424-343.000.

Gorman, William W., Jr.; and Gorman, Esther M., to E-C Apparatus Corporation. Distribution device. 4,200,611, Cl. 422-258.000.

Gorog, Sandor: *See—*
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.

Gorton, William S., Jr.; and Buckley, Richard D., to Westinghouse Electric Corp. Method of constructing an electrical winding assembly. 4,199,862, Cl. 29-605.000.

Goudie, Alexander C., to Beecham Group Limited. Pyrroie derivatives. 4,200,645, Cl. 424-274.000.

Gould, Henry D. Swimming pool cleaning head. 4,200,230, Cl. 239-66.000.

Gould Inc.: *See—*
Kodama, Roy K., 4,199,991, Cl. 73-706.000.

Grabowski, Idzi: *See—*
Engel, Zbigniew; Kepinski, Marek; and Grabowski, Idzi, 4,199,969, Cl. 72-76.000.

Graczyk, Edward W., to J. E. Myles, Inc. Pressure indicator. 4,199,993, Cl. 73-744.000.

Gragson, James T., to Phillips Petroleum Company. Method for producing filaments of high tenacity. 4,200,602, Cl. 264-28.000.

Grants, Valdis: *See—*
Struger, Odo J.; Grants, Valdis; and Grudowski, Raymond A., 4,200,915, Cl. 364-900.000.

Graphic Scanning Corp.: *See—*
Vicari, Ronald P.; and Yampol, Barry, 4,200,772, Cl. 179-27.0FH.

Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, to Chemische Werke Huls A.G. Method of producing blocked polyisocyanates by reaction of an imidazoline with an isocyanate. 4,200,725, Cl. 528-49.000.

Gray, Paul R.: *See—*
Hodges, David A.; Gray, Paul R.; and McCreary, James L., 4,200,863, Cl. 340-347.0AD.

Greenwood, Michael S., to Weyerhaeuser Company. Method for inducing early flowering on young forest trees. 4,199,897, Cl. 47-58.000.

Gregory, Gordon I.: *See—*
Cook, Martin C.; Gregory, Gordon I.; and Bradshaw, Janice, 4,200,746, Cl. 544-25.000.

Greif, Norbert: *See*—
Perner, Johannes; Greif, Norbert; Fikentscher, Rolf; and Diessel, Paul, 4,200,733, Cl. 528-417.000.
Grey, John C. Thrust transmission or thrust producing device. 4,199,964, Cl. 64-29.000.
Grier, Jack B.: *See*—
Shoup, Gary L.; and Grier, Jack B., 4,199,904, Cl. 51-423.000.
Griffith, Cecil B.: *See*—
Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., 4,200,137, Cl. 164-49.000.
Griffith, Donald P. Urine preservative composition. 4,200,651, Cl. 424-320.000.
Grillo-Werke Aktiengesellschaft: *See*—
Desai, Natvarlal B., 4,200,500, Cl. 203-7.000.
Grimm, Heinz: *See*—
Sterk, Zvonimir; Sawitzki, Martin; and Grimm, Heinz, 4,200,061, Cl. 122-32.000.
Grinshtein, Vladimir Y.: *See*—
Volman, Mikhail Y.; Grinshtein, Vladimir Y.; Zhukov, Mikhail L.; and Kuchuk, Ivan A., 4,200,899, Cl. 361-333.000.
Grisar, J. Martin; and Claxton, George P., to Richardson-Merrell Inc. 2-Hydroxy-5-[1-hydroxy-2-[4-(2-oxo-1-benzimidazolinyl)-piperidino]ethyl]benzoic acid derivatives. 4,200,755, Cl. 546-199.000.
Grossart, Peter S. K.: *See*—
Bass, Richard A.; and Grossart, Peter S. K., 4,200,163, Cl. 180-219.000.
Grossman, Leonard N.; and Packard, Douglas R., to General Electric Company. Alloys for gettering moisture and reactive gases. 4,200,460, Cl. 75-177.000.
Grothe, Klaus: *See*—
Korn, Hans; Grothe, Klaus; and Bauer, Wolfgang, 4,200,309, Cl. 280-750.000.
Group Industries Incorporated: *See*—
Kennedy, Edward S., 4,200,316, Cl. 292-256.670.
Gruben, Arne: *See*—
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.
Grudowski, Raymond A.: *See*—
Struger, Odo J.; Grants, Valdis; and Grudowski, Raymond A., 4,200,915, Cl. 364-900.000.
Grumman Aerospace Corporation: *See*—
August, Arthur; and Huber, John G., 4,200,271, Cl. 269-21.000.
Grundmann, Raban: *See*—
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, 4,200,703, Cl. 525-357.000.
Gruner & Jahr AG & Co.: *See*—
Wangermann, Jochen, 4,200,275, Cl. 270-53.000.
GTE Sylvania Incorporated: *See*—
Dziedzic, Chester J.; Kleiner, Richard N.; and Cleveland, Joseph J., 4,200,604, Cl. 264-101.000.
Shaffer, John W.; Bricker, Daniel W.; and Audesse, Emery G., 4,200,901, Cl. 362-5.000.
Guenzel, Peter; Rosskamp, Guenter; Kolberg, Reiner; and Porep, Hans-Juergen, to Schering Aktiengesellschaft. Apparatus for the inhalation of medicinal agents. 4,200,099, Cl. 128-266.000.
Guile, Donald L.: *See*—
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,200,445, Cl. 65-18.000.
Gulf Oil Corporation: *See*—
Lynch, Thomas J.; and Rowatt, Robert J., 4,200,715, Cl. 526-88.000.
Gulf & Western Industries, Inc.: *See*—
Seipp, William H., 4,200,916, Cl. 364-900.000.
Gullino, Pietro M.: *See*—
Knazek, Richard A.; Gullino, Pietro M.; and Frankel, David S., 4,200,689, Cl. 435-2.000.
Gunti, Rolf, to Masyc A.G. Transfer conveyor for piece goods conveyors. 4,200,178, Cl. 198-372.000.
Gute, Loren R.; and Fannin, Wayne V., to General Motors Corporation. Bumper supporting energy absorber for vehicles. 4,200,318, Cl. 293-136.000.
Gutehoffnungshutte Sterkrade A.G.: *See*—
Laubach, Winfried; Kienbaurn, Heinz; and Thomas, Rolf, 4,200,400, Cl. 366-233.000.
H. K. Productions Limited: *See*—
Keondjian, Hagop; and Bugbee, Stanley W., 4,200,365, Cl. 353-29.000.
H. Strunck GmbH & Co. Maschinenfabrik: *See*—
Pennekamp, Ingbert, 4,200,470, Cl. 134-1.000.
Haberle, Friedrich: *See*—
Kress, Dieter; and Haberle, Friedrich, 4,200,418, Cl. 408-143.000.
Habjan, Joza: *See*—
Jenko, Branko; Langof, Igor; and Habjan, Joza, 4,200,761, Cl. 548-342.000.
Hachtmann, James E.: *See*—
Sherif, Sherif A.; and Hachtmann, James E., 4,200,672, Cl. 427-226.000.
Hackstaff, Alain: *See*—
Larsen, Morrie E.; and Hackstaff, Alain, 4,200,837, Cl. 455-92.000.
Hagelberg, Gabriella, to Bengt Petersson New Products Investment AB. Grammophone record sleeve. 4,200,189, Cl. 206-313.000.
Hagemann, Julius, to United States of America, Navy. Self-propelled vehicle for destroying ground mines. 4,200,922, Cl. 367-96.000.
Hager, Clarence H., to Modern Suspension Systems, Inc. Stock rack with pivoted trays. 4,200,195, Cl. 211-24.000.
Hager, Klaus; and Voss, Klaus, to Robert Bosch GmbH. Arrangement for withdrawing particles of material removed by a working tool. 4,200,417, Cl. 408-67.000.
Hajos, Gyorgy: *See*—
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Hakanson, Alton L.; and Schafer, Wilbur C. Prelubricating and lubricating systems for engines. 4,199,950, Cl. 60-605.000.
Hakluytt, John P. D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Combustion apparatus. 4,199,935, Cl. 60-734.000.
Haldimann, Hans R., to Weelpal A.G. Apparatus for moving articles in a shelf storage unit. 4,200,421, Cl. 414-280.000.
Hall, Burness C. Programmable time varying control system and method. 4,200,910, Cl. 364-104.000.
Hall, Dale E.; and Huston, Ernest L., to International Nickel Company, Inc., The. Sintered metal powder-coated electrodes for water electrolysis prepared with polysilicate-based paints. 4,200,515, Cl. 204-290.00R.
Hall, Walter L.; and Humphrey, James S., Jr., to General Electric Company. Glass coated polycarbonate articles. 4,200,681, Cl. 428-412.000.
Halliburton Company: *See*—
Burnham, John W.; and Tiner, Robert L., 4,200,539, Cl. 252-8.55R.
Burnham, John W., 4,200,540, Cl. 252-8.55R.
Hamada, Nagaharu: *See*—
Murayama, Norio; Hayashi, Yukitaka; Hamada, Nagaharu; and Hara, Toshitaka, 4,200,869, Cl. 340-723.000.
Hamilton, Brian K.; Garner, Eugene F.; and Harrell, Terry R., to Allied Chemical Corporation. All-pyrotechnic inflator. 4,200,615, Cl. 422-166.000.
Hammann, Ingeborg: *See*—
Maurer, Fritz; Schroder, Rolf; and Hammann, Ingeborg, 4,200,637, Cl. 424-251.000.
Hammon, Fritz: *See*—
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.
Hamprecht, Gerhard: *See*—
Linhart, Friedrich; Stubenrauch, Gerd; and Hamprecht, Gerhard, 4,200,743, Cl. 544-11.000.
Handal, Anthony H.: *See*—
Ambrose, Robert L., 4,199,962, Cl. 63-15.000.
Hannart, Jean A. A. J., to Omnium Chimique Societe Anonyme. Indole derivatives and therapeutically acting drugs. 4,200,638, Cl. 424-256.000.
Hansen, Amy L.: *See*—
Hansen, Edwin L.; and Hansen, Amy L., 4,199,873, Cl. 34-202.000.
Hansen, Edwin L.; and Hansen, Amy L., to Veach Development Company, Inc. Foldable panty hose dryer. 4,199,873, Cl. 34-202.000.
Hansen, Rudolf, to Steinbock GmbH. Arm rest for the operator's seat on a moving machine. 4,200,166, Cl. 180-77.00R.
Hansen, Uwe J.: *See*—
Berndt, Gerhard; Kapell, Gerhard; Schummer, Anton; and Hansen, Uwe J., 4,200,265, Cl. 266-212.000.
Happel, Fritz. Method and apparatus for machine milking. 4,200,058, Cl. 119-14.010.
Hara, Toshitaka: *See*—
Murayama, Norio; Hayashi, Yukitaka; Hamada, Nagaharu; and Hara, Toshitaka, 4,200,869, Cl. 340-723.000.
Harada Industry Co., Ltd.: *See*—
Harada, Jiro, 4,200,874, Cl. 343-715.000.
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Harker Co., Ltd.: *See*—
Richardson, David W.; and Husker, Colin, 4,199,957, Cl. 62-275.000.
Harrell, Terry R.: *See*—
Hamilton, Brian K.; Garner, Eugene F.; and Harrell, Terry R., 4,200,615, Cl. 422-166.000.
Harrington, Wayne D.; and Musa, Fuad H., to Motorola, Inc. Processor interrupt system. 4,200,912, Cl. 364-200.000.
Harris, Arthur M. Specimen removal instrument. 4,200,111, Cl. 128-751.000.
Harris, Frank W., to Valleylab, Inc. Contact area measurement apparatus for use in electrosurgery. 4,200,104, Cl. 128-303.140.
Harris, Walter E.: *See*—
Quick, Graeme R.; Harris, Walter E.; Riddle, Ernest J.; and Robinson, Terrence S., 4,199,925, Cl. 56-208.000.
Hartel, Gerhard: *See*—
Glock, Hans; and Hartel, Gerhard, 4,200,918, Cl. 365-210.000.
Hartemann, Pierre: *See*—
Valdois, Michel; Levesque, Patrick; and Hartemann, Pierre, 4,199,990, Cl. 73-517.0AV.
Hartig, Wolfgang; and Lenk, Erich, to Barmag Barmer Maschinenfabrik AG. Process and apparatus for conveying individual strands into a composite strand under controlled speeds and tensions. 4,200,212, Cl. 226-24.000.
Hartmann, Job-Werner: *See*—
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.

Hartmann, Klaus: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,200,397, Cl. 356-429.000.
Hasebe, Mitsuo; Watanabe, Mutsuo; Hibi, Kunio; and Watanuki, Masayosi, to Ricoh Company, Ltd. Toner density sensor for electrostatic copying machine. 4,200,388, Cl. 355-3.0DD.
Hashimoto, Masakatsu: *See*—
Mochida, Ei; Ogawa, Nobuhisa; Shinkai, Hiroyuki; and Hashimoto, Masakatsu, 4,200,436, Cl. 23-230.00B.
Haslund, Ralph L., to Boeing Company, The. Unitary supersonic electrical discharge laser nozzle-channel. 4,200,819, Cl. 313-148.000.
Hassenauer, Robert L., to Evans Products Company. Pneumatic hopper gate. 4,200,208, Cl. 222-505.000.
Hatano, Takashi: *See*—
Yamazaki, Kaoru; Kurioka, Shunichiro; Hatano, Takashi; Asada, Sadame; and Yasuda, Mariko, 4,200,719, Cl. 526-220.000.
Hatano, Yoshihiro: *See*—
Ikegami, Seiji; and Hatano, Yoshihiro, 4,200,751, Cl. 546-89.000.
Hattori, Kyo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air supply system for the exhaust system of an internal combustion engine. 4,199,939, Cl. 60-276.000.
Hattori, Tadashi: *See*—
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,199,938, Cl. 60-274.000.
Hatzinicolaides, John A.; and Papamantellos, Demetrios C., to Larco, Societe Miniere et Metallurgique de Larymna S.A.; and Eisenwerk-Gesellschaft Maximilianshutte m.b.H. Process for the production of nickel alloys. 4,200,453, Cl. 75-52.000.
Hauni-Werke Korber & Co. KG.: *See*—
Hinz, Werner, 4,200,179, Cl. 198-458.000.
Hauptmann, Gunter: *See*—
Raffel, Reiner; Hauptmann, Gunter; Reffelmann, Gerd; and Ebeling, Wilfried, 4,200,603, Cl. 264-51.000.
Hauschild, Arthur: *See*—
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.
Hausler, Michael; and Sadek, Kadry, to Brown, Boveri & Cie Aktiengesellschaft. Method of taking a pole of a high-voltage d-c transmission station out of service. 4,200,907, Cl. 363-35.000.
Hawkes, Thaddeus; Reymond, Jean C.; and Trocellier, Roger, to Thomson-CSF. Coupler for optical communication system. 4,200,356, Cl. 350-96.160.
Hawkins, Fletcher G.: *See*—
Hood, Clarence E.; McHugh, Carl M.; and Hawkins, Fletcher G., 4,199,913, Cl. 53-244.000.
Hayashi, Yukitaka: *See*—
Murayama, Norio; Hayashi, Yukitaka; Hamada, Nagaharu; and Hara, Toshitaka, 4,200,869, Cl. 340-723.000.
Health-Mor, Inc.: *See*—
Martinec, Eugene F., 4,199,839, Cl. 15-354.000.
Heck, Roland H.: *See*—
Stein, Thomas R.; Heck, Roland H.; and Dabkowski, Michael J., 4,200,521, Cl. 208-216.0PP.
Hedbom, Hans S., to Aktiebolaget Carl Munters. Device for the exchange of heat between supply air and exhaust air in indoor premises. 4,200,147, Cl. 165-104.00S.
Hefendehl, Hans Friedrich: *See*—
Zeischegg, Walter; and Brussing, Bernd, 4,200,194, Cl. 206-507.000.
Heil-Quaker Corporation: *See*—
Anderson, Richard M.; and Beehler, Richard F., 4,200,117, Cl. 137-512.100.
Hein, Carl C., III; and Spitz, Joseph J., to American Can Company. Sheet dispensing carton. 4,200,200, Cl. 221-48.000.
Heine, Hans-Georg: *See*—
Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, 4,200,643, Cl. 424-272.000.
Heinzl, Joachim, to Siemens Aktiengesellschaft. Process and arrangement for selectively transmitting predetermined characters or graphic patterns. 4,200,769, Cl. 178-30.000.
Hellers, Bo G., to Evak Sanitar AB. Vacuum toilet apparatus for mobile units. 4,199,828, Cl. 4-321.000.
Hellman, Martin E.; Diffie, Bailey W.; and Merkle, Ralph C., to Stanford University. Cryptographic apparatus and method. 4,200,770, Cl. 178-22.000.
Helmets Limited: *See*—
Jenkins, Alan N.; and Taylor, Michael, 4,199,823, Cl. 2-424.000.
Helmig, Richard W.; and Berwick, Clinton L., to Rotographic Machinery. Apparatus for forming a horizontal stack of vertically oriented sheets. 4,200,016, Cl. 83-88.000.
Helms, Bland E., to Helms, Bland E. Universally swiveling tractor hitch. 4,200,306, Cl. 280-494.000.
Helmut Darda Spielwaren und Maschinenbau GmbH Im Tal: *See*—
Rittinger, Herbert, 4,199,893, Cl. 46-1.00K.
Helting, Torsten B., to Behringwerke Aktiengesellschaft. Atoxic, immunogenic product of tetanus toxin. 4,200,627, Cl. 424-92.000.
Helton, Wayland. Shovel with improved lifting means. 4,200,324, Cl. 294-58.000.
Hendrickson, Phillip H.: *See*—
Takeuchi, Masaya; and Hendrickson, Phillip H., 4,200,376, Cl. 354-62.000.
Henneberger, Heinz: *See*—
Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, 4,200,397, Cl. 356-429.000.
Hennequin, Petrus J., to Hunter Douglas International N.V. Venetian blind tilting and lifting unit. 4,200,135, Cl. 160-168.00A.
Henrick, Clive A.; and Kohn, Gustave K., to Zoecon Corporation. 2,4-Imidazolidinedionylmethyl esters and thiolesters of anilino acids. 4,200,758, Cl. 548-312.000.
Henry, Ronald A., to United States of America, Navy. Water-soluble fluorescing and lasing dyes. 4,200,753, Cl. 546-116.000.
Herbert, Lesley D.: *See*—
Robinson, Joseph G.; and Herbert, Lesley D., 4,200,556, Cl. 260-3.000.
Herbst, Richard L., to Quanta-Ray, Inc. Continuously tunable wide-band coherent infrared source. 4,200,808, Cl. 307-425.000.
Herr, Charles H., Jr.; and McLees, Alan L., to Caterpillar Tractor Co. Test stand. 4,199,979, Cl. 73-134.000.
Herzog, James M.: *See*—
Ochs, Charles S.; and Herzog, James M., 4,199,914, Cl. 53-314.000.
Hesford, Frank W.: *See*—
Borzcik, Paul S.; and Hesford, Frank W., 4,200,936, Cl. 364-900.000.
Hess, Hans-Peter: *See*—
Muhling, Gunter; and Hess, Hans-Peter, 4,199,899, Cl. 49-352.000.
Hesston Corporation: *See*—
Anderson, Carl M., 4,200,157, Cl. 172-264.000.
Hewitt, Burton L. Power-operated drill pipe spinner and pipe tongs. 4,200,010, Cl. 81-57.160.
Hewlett-Packard Company: *See*—
McMorrow, Richard H., Jr., 4,200,109, Cl. 128-696.000.
Hewlett, Roy: *See*—
Agnew, Kenneth M.; Denroche, Charles H. P.; and Hewlett, Roy, 4,200,404, Cl. 402-22.000.
Heyer, Raymond F.; and Klecker, Gary J., to Minnesota Mining and Manufacturing Company. Scouring ball. 4,199,835, Cl. 15-209.00B.
Heyligenstaedt & Comp., Werkzeugmaschinenfabrik GmbH: *See*—
Dormehl, Erich, 4,200,014, Cl. 82-2.700.
Heymer, Gero: *See*—
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,200,620, Cl. 423-321.00S.
Hibi, Kunio: *See*—
Hasebe, Mitsuo; Watanabe, Mutsuo; Hibi, Kunio; and Watanuki, Masayosi, 4,200,388, Cl. 355-3.0DD.
Hickey, Michael E.: *See*—
Buege, John A.; Hickey, Michael E.; and Rautela, Gopal S., 4,200,691, Cl. 435-17.000.
Highsmith, Albert E., to Dresser Industries, Inc. Sealing system for a rotary rock bit. 4,200,343, Cl. 308-8.200.
Hignett, Rosemary R.; and Davidson, Peter J., to Johnson, Matthey & Co., Limited. Catalytic hydroformylation. 4,200,591, Cl. 260-604.0HF.
Hignett, Rosemary R.; and Davidson, Peter J., to Johnson, Matthey & Co., Limited. Catalytic hydroformylation. 4,200,592, Cl. 260-604.0HF.
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., to Campbell Soup Company. Protein texturization by steam injection. 4,200,041, Cl. 99-483.000.
Hildebrandt, Peter, to Linde Aktiengesellschaft. Process for the shielding of a casting stream in a casting apparatus. 4,200,138, Cl. 164-66.000.
Hill, David A.: *See*—
Sitkins, Fred Z.; and Hill, David A., 4,199,833, Cl. 7-166.000.
Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, to SmithKline Corporation. Method for preparing auranofin. 4,200,738, Cl. 536-121.000.
Hill, Elmer D. System and method for painting images by synthetic color signal generation and control. 4,200,867, Cl. 340-703.000.
Hilpert, Wolfgang; Komander, Gerhard; and Stotz, Manfred, to Daimler-Benz Aktiengesellschaft. Installation for the continuous measurement of the fuel consumption of internal combustion engines. 4,199,977, Cl. 73-119.00A.
Hilti Aktiengesellschaft: *See*—
Maier, Elmar, 4,200,216, Cl. 227-136.000.
Hinlein, Sigmund: *See*—
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, 4,200,894, Cl. 360-106.000.
Hinz, Werner, to Hauni-Werke Korber & Co. KG. Apparatus for changing the distance between pairs of coaxial cigarettes or the like. 4,200,179, Cl. 198-458.000.
Hirai, Hidematsu. Method and composition for detecting antigenic substances. 4,200,508, Cl. 204-180.00G.
Hirose, Matutaro: *See*—
Yamagishi, Kiichiro; Hirose, Matutaro; and Muramatsu, Sachio, 4,200,211, Cl. 226-21.000.
Hitachi, Ltd.: *See*—
Imai, Kuninori; Takahashi, Soji; and Akeyama, Masamoto, 4,200,217, Cl. 228-161.000.
Matsumoto, Kuniaki, 4,200,911, Cl. 364-105.000.
Morioka, Takayuki; and Ide, Jushi, 4,200,865, Cl. 340-536.000.
Murayama, Norio; Hayashi, Yukitaka; Hamada, Nagaharu; and Hara, Toshitaka, 4,200,869, Cl. 340-723.000.
Sato, Kanemasa; Ueno, Sadayasu; and Ichikawa, Norio, 4,200,511, Cl. 204-195.00S.
Sato, Yoshihiko; and Kubota, Masayuki, 4,200,177, Cl. 198-335.000.
Suzuki, Takaya; Ura, Mitsuru; and Ogawa, Takuzo, 4,200,877, Cl. 357-13.000.

Ueno, Masahiro; and Masuda, Ikuro, 4,200,225, Cl. 371-27.000.
Hitachi Medical Corporation: *See—*
Murakami, Fumio; Enya, Takeshi; and Ochiai, Yoshinori, 4,200,796, Cl. 250-402.000.
Nagasawa, Yasuo; and Yamada, Junichi, 4,200,793, Cl. 250-363.00S.
Hitachi Seiko Ltd.: *See—*
Tagashira, Satoshi; Motegi, Akira; and Ishiguro, Toshio, 4,200,390, Cl. 355-14.00R.
Hobart Corporation: *See—*
Crane, Herbert R., 4,199,840, Cl. 17-16.000.
Hobbs, Thomas G., Jr.; and Stephens, Eugene A., to C. B. Fleet Company Incorporated. Disposable douche. 4,200,097, Cl. 128-251.000.
Hodges, Carolyn M.: *See—*
Hodges, Dean R.; and Hodges, Carolyn M., 4,199,920, Cl. 54-1.000.
Hodges, David A.; Gray, Paul R.; and McCreary, James L., to University of California, The Regents of the. Weighted capacitor analog/-digital converting apparatus and method. 4,200,863, Cl. 340-347.0AD.
Hodges, Dean R.; and Hodges, Carolyn M. Mane taming device. 4,199,920, Cl. 54-1.000.
Hoechst Aktiengesellschaft: *See—*
Burghardt, Wolfgang; and Bronner, Wilhelm, 4,200,471, Cl. 134-22.00R.
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,200,620, Cl. 423-321.00S.
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,200,558, Cl. 260-17.00A.
Stein, Eckehard, 4,200,496, Cl. 202-153.000.
Hoffman, Robert. Modulation contrast microscope with three regions. 4,200,353, Cl. 350-13.000.
Hoffman, Robert. Microscopy systems with rectangular illumination particularly adapted for viewing transparent objects. 4,200,354, Cl. 350-13.000.
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, to Societe Nationale Industrielle Aerospatiale. Process and device for generating stochastically coded constants. 4,200,935, Cl. 364-717.000.
Hoffmann-La Roche Inc.: *See—*
Bollag, Werner; and Reber, Kurt, 4,200,647, Cl. 424-305.000.
Suchy, Milos, 4,200,587, Cl. 260-566.0AE.
Hoffmann, Werner, to BASF Aktiengesellschaft. Preparation of hydroxycitronellol. 4,200,766, Cl. 568-875.000.
Hofmann, Otto, to Messerschmitt-Bolkow-Blohm GmbH. Circuit arrangement for correcting digital signals. 4,200,934, Cl. 364-571.000.
Hofstein, Steven R., to Princeton Electronic Products, Inc. Ultrasonic scope. 4,200,885, Cl. 358-112.000.
Hogue, Guy. One piece hand grip for pistol. 4,199,887, Cl. 42-71.00P.
Holden, Kenneth G.; and Perchonock, Carl D., to SmithKline Corporation. Method for preparing 7,8-dichloro-1,2,3,4-tetrahydroisoquinoline. 4,200,754, Cl. 546-150.000.
Holden, Kenneth G.: *See—*
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,200,572, Cl. 260-239.00A.
Holderbaum, Karl H., to Jos. Schneider & Co., Optische Werke Kreuznach. Focusing mechanism for camera objective. 4,200,377, Cl. 354-195.000.
Holland, Richard W., to Fairchild Camera and Instrument Corporation. Low force printed circuit board connector apparatus. 4,200,349, Cl. 339-75.0MP.
Holle, Werner, to Ernst Leitz Wetzlar GmbH. Electrooptical focusing apparatus for photographic cameras. 4,200,786, Cl. 250-204.000.
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, to Hoechst Aktiengesellschaft. Method of producing hydrophilic articles of water-insoluble polymers. 4,200,558, Cl. 260-17.00A.
Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.): *See—*
Iiyama, Masahiko; and Itaya, Kazunori, 4,200,596, Cl. 261-65.000.
Honda, Zenjiro: *See—*
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,200,726, Cl. 528-99.000.
Honma, Tsunetoshi: *See—*
Igarashi, Kikuo; Irisawa, Junji; and Honma, Tsunetoshi, 4,200,628, Cl. 424-180.000.
Honmann, Winfried; and Schaal, Gerd E., to LTG Lufttechnische GmbH. Regenerative heat exchanger. 4,200,441, Cl. 55-181.000.
Hood, Clarence E.; McHugh, Carl M.; and Hawkins, Fletcher G., to Clemson University. Orchard fruit handling system. 4,199,913, Cl. 53-244.000.
Hooker, Donald E., to Bally Manufacturing Corporation. Device with hold and advance feature for the reels of a game machine. 4,200,291, Cl. 273-143.00R.
Hopkins, Gary L., to Eaton Corporation. Wheel speed sensor including electro-magnetic pickup. 4,200,816, Cl. 310-168.000.
Hori, Fumio. Apparatus for obtaining Mg and Ca through carbon reduction. 4,200,264, Cl. 266-149.000.
Hori, Nobutaka: *See—*
Okuda, Hirohisa; and Hori, Nobutaka, 4,200,626, Cl. 424-51.000.
Horie, Mitsuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pneumatic brake booster. 4,199,951, Cl. 60-613.000.
Horigome, Koichi: *See—*
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.
Horlbeck, Gernot; and Burzin, Klaus, to Chemische Werke Huls A.G. Process for preparing very viscous heat stable poly(butylene terephthalate). 4,200,732, Cl. 528-274.000.
Hornung, Adolf: *See—*
Klenk, Emil; and Hornung, Adolf, 4,200,277, Cl. 271-90.000.
Horodysky, Andrew G., to Mobil Oil Corporation. Metal salt treated sulfurized olefins and organic compositions containing same. 4,200,546, Cl. 252-46.400.
Hortobagyi, Gyozo: *See—*
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Hotta, Tadahiko: *See—*
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,200,879, Cl. 357-43.000.
Houseknecht, Keith J., to Singer Company, The. Slide presence shutter lock. 4,200,368, Cl. 353-88.000.
Hoveler, Egon, to Jagenberg-Werke Atkiengesellschaft. Device for pressing labels or foils onto objects. 4,200,483, Cl. 156-487.000.
Hoyt, John M., to National Distillers and Chemical Corporation. Gas-sparging of ethylene-vinyl ester interpolymers to suppress discoloration on alcoholysis thereof. 4,200,709, Cl. 525-62.000.
Hsu, Ying Y., to Timex Corporation. Dioxanylphenyl benzoate liquid crystal compounds. 4,200,580, Cl. 260-340.700.
Hubach, Richard A.; DeZotell, Gary L.; and Sacks, Jack, to View Engineering, Inc. Pattern recognition apparatus and method. 4,200,861, Cl. 340-146.30Q.
Huber, John G.: *See—*
August, Arthur; and Huber, John G., 4,200,271, Cl. 269-21.000.
Huber, Theodor: *See—*
Borowski, Kurt; Cocron, Istvan; and Huber, Theodor, 4,200,364, Cl. 352-141.000.
Huber, Werner: *See—*
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,200,467, Cl. 106-47.00Q.
Huddart, John; and Huddart, Robin. Capacitive measuring apparatus. 4,199,984, Cl. 73-304.00C.
Huddart, Robin: *See—*
Huddart, John; and Huddart, Robin, 4,199,984, Cl. 73-304.00C.
Huff, Roger K.; Evans, David D.; and Anderson, Nicholas H., to Imperial Chemical Industries Limited. Insecticidal compound and method of use. 4,200,653, Cl. 424-322.000.
Huffman, William F.: *See—*
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,200,572, Cl. 260-239.00A.
Hughes Aircraft Company: *See—*
Forward, Robert L.; and Peterson, Robert W., 4,199,989, Cl. 73-430.000.
Hughes, Jeffrey F.; Liptay, John S.; Rymarczyk, James W.; and Stone, Stanley E., to International Business Machines Corporation. Multi-instruction stream branch processing mechanism. 4,200,927, Cl. 364-200.000.
Hughes, Michael P.: *See—*
Slinkard, William E.; Baylis, Anthony B.; and Hughes, Michael P., 4,200,764, Cl. 562-549.000.
Humiston, Gerald F. Method of electrical closed heat pump system for producing electrical power. 4,200,807, Cl. 290-1.00R.
Humphrey, James S., Jr.: *See—*
Hall, Walter L.; and Humphrey, James S., Jr., 4,200,681, Cl. 428-412.000.
Hundt, Murray T.: *See—*
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,200,041, Cl. 99-483.000.
Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,200,313, Cl. 282-27.500.
Hunt, William A., to Eimco (Great Britain) Limited. Fluid transmission circuit. 4,199,943, Cl. 60-430.000.
Hunter Douglas International N.V.: *See—*
Hennequin, Petrus J., 4,200,135, Cl. 160-168.00A.
Huntington Alloys, Inc.: *See—*
Smith, Darrell F., Jr.; Tipton, David G.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., 4,200,459, Cl. 75-170.000.
Hurley, Donald C., Jr. Glaze-forming composition. 4,200,468, Cl. 106-48.000.
Hush, James M.; and McPhee, Donald J., to Gates Rubber Company, The. Tubular article. 4,200,125, Cl. 138-126.000.
Husker, Colin: *See—*
Richardson, David W.; and Husker, Colin, 4,199,957, Cl. 62-275.000.
Huston, Ernest L.: *See—*
Hall, Dale E.; and Huston, Ernest L., 4,200,515, Cl. 204-290.00R.
Hutchens Industries Inc.: *See—*
King, John B., 4,200,267, Cl. 267-52.000.
Hwang, Chuang-Li. Twisting car. 4,200,304, Cl. 280-218.000.
Hydra-Troll, Inc.: *See—*
Siegel, Dale, 4,200,055, Cl. 115-18.00A.
I.B.P. Industrie Buitoni Perugina S.p.A.: *See—*
Moscatelli, Silvano, 4,199,919, Cl. 53-552.000.
Ichikawa, Norio: *See—*
Sato, Kanemasa; Ueno, Sadayasu; and Ichikawa, Norio, 4,200,511, Cl. 204-195.00S.
IDC Chemie AG: *See—*
Mader, Karl, 4,200,700, Cl. 521-186.000.
Ide, Jushi: *See—*
Morioka, Takayuki; and Ide, Jushi, 4,200,865, Cl. 340-536.000.
Ideal Toy Corporation: *See—*
Ryan, John W.; and Moore, James D., 4,200,287, Cl. 273-86.00B.

Igarashi, Kikuo; Irisawa, Junji; and Honma, Tsunetoshi, to Shionogi & Co., Ltd. Novel aminoglycoside derivatives. 4,200,628, Cl. 424-180.000.

Iiyama, Masahiko; and Itaya, Kazunori, to Honda Giken Kogyo Kabushiki Kaisha (Honda Motor Co., Ltd.). Throttle valve apparatus in an internal combustion engine and its method of operation. 4,200,596, Cl. 261-65.000.

Ijichi Shukeijo Co., Ltd.: *See*—
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, 4,199,958, Cl. 62-374.000.

Ikedo, Yuji, to Pioneer Electronic Corporation. Control mechanism for lifting, lowering and swinging record player tonearm. 4,200,295, Cl. 274-15.00R.

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Imai, Chikara: *See*—
Sakamoto, Koji; Tatsumi, Susumu; and Imai, Chikara, 4,200,391, Cl. 355-14.00E.

Imai, Kuninori; Takahashi, Soji; and Akeyama, Masamoto, to Hitachi, Ltd. Method of manufacturing an article having a press-worked member inwardly of a cylindrical member. 4,200,217, Cl. 228-161.000.

Imaizumi, Hiroyuki: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Imamura, Tetuo; Yasuhara, Minoru; and Teramae, Masaru, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Production of reinforced plastic pipes. 4,200,605, Cl. 264-145.000.

Imperial Chemical Industries Limited: *See*—
Huff, Roger K.; Evans, David D.; and Anderson, Nicholas H., 4,200,653, Cl. 424-322.000.
Large, Michael S.; and Smith, Leslie H., 4,200,652, Cl. 424-321.000.

Inaba, Masao; and Kashigi, Kazuo, to Nippon Electric Company, Ltd. Digital video effects system employing a chroma-key tracking technique. 4,200,890, Cl. 358-183.000.

Inami, Fumiaki; and Okada, Akiyosi, to Toyo Kogyo Co., Ltd. Rear compartment arrangements for van type motor vehicle. 4,200,329, Cl. 296-69.000.

Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Farina, Attilio; and Zappala, Giuseppe, 4,200,824, Cl. 315-408.000.

Industria Macchine Impianti: *See*—
Cruccu, Antonio, 4,200,447, Cl. 65-76.000.

Information National, Inc.: *See*—
Richards, John S.; and DePaoli, Alan G., 4,200,369, Cl. 354-7.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Bovio, Michele; and Castellano, Pietro, 4,200,778, Cl. 200-159.00B.
Gindri, Eridiano, 4,200,278, Cl. 271-296.000.

Inoue Attachment Kabushiki Kaisha: *See*—
Inoue, Masaomi, 4,200,089, Cl. 128-12.000.

Inoue-Japax Research Inc.: *See*—
Inoue, Kiyoshi, 4,200,674, Cl. 427-290.000.

Inoue, Kiyoshi, to Inoue-Japax Research Inc. Method of preparing heat-transfer members. 4,200,674, Cl. 427-290.000.

Inoue, Masaomi, to Inoue Attachment Kabushiki Kaisha. Mouth corner spreader. 4,200,089, Cl. 128-12.000.

Inoue, Takehito: *See*—
Okada, Isamu; and Inoue, Takehito, 4,200,836, Cl. 324-51.000.

Institute of Gas Technology: *See*—
Wurm, Jaroslav, 4,199,959, Cl. 62-480.000.

Institutul National Pentru Creatie Stiintifica Si Tehnica-Increst: *See*—
Teodorescu, Constantin; Chiriac, Ilie; Sava, Cornel D.; Draghici, Adrian; and Zinca, Sabin, 4,200,425, Cl. 417-178.000.

International Business Machines Corporation: *See*—
Hughes, Jeffrey F.; Liptay, John S.; Rymarczyk, James W.; and Stone, Stanley E., 4,200,927, Cl. 364-200.000.
Kuhar, Eugene; and Smith, Donald L., 4,200,913, Cl. 364-900.000.
Lamoureux, William R.; Martin, William J.; and Trushell, James B., 4,200,868, Cl. 340-713.000.
Oswald, Richard K., 4,200,827, Cl. 318-561.000.
Queener, Carl A., 4,200,386, Cl. 355-14.0SH.

International Flavors & Fragrances Inc.: *See*—
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,741, Cl. 544-5.000.
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,742, Cl. 544-5.000.

International Minerals & Chemical Corporation: *See*—
Wehrmeister, Herbert L., 4,200,646, Cl. 424-302.000.

International Nickel Company, Inc., The: *See*—
Hall, Dale E.; and Huston, Ernest L., 4,200,515, Cl. 204-290.00R.

International Paper Company: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,200,488, Cl. 162-101.000.

International Playtex, Inc.: *See*—
Marder, Herman L.; Field, Nathan D.; and Shinohara, Makoto, 4,200,737, Cl. 536-87.000.
Shinohara, Makoto; and Field, Nathan D., 4,200,736, Cl. 536-87.000.

International Promotion Public Relation Establishment: *See*—
de Rosnay, Arnaud L. G., 4,200,302, Cl. 280-1.000.

International Telephone and Telegraph Corporation: *See*—
Anhalt, John W.; Goodman, David S.; and Selvin, Gerald J., 4,200,768, Cl. 174-79.000.
Shelby, Billy L.; and Moore, William C., 4,200,905, Cl. 362-396.000.

Intrator, Charles. Photography light. 4,200,902, Cl. 362-17.000.

Investigacion FIC Fideicomiso: *See*—
Martin, John K., 4,200,449, Cl. 65-229.000.

Ippolito, Anthony C.: *See*—
Carley, Joseph C.; and Ippolito, Anthony C., 4,200,022, Cl. 84-1.260.

Ipri, Alfred C., to RCA Corporation. Method of fabricating a narrow base-width bipolar device and the product thereof. 4,200,878, Cl. 357-35.000.

Irani, Mazin R.: *See*—
Cassella, Vincent J.; and Irani, Mazin R., 4,200,527, Cl. 210-49.000.
Cassella, Vincent J.; and Irani, Mazin R., 4,200,528, Cl. 210-49.000.

Irisawa, Junji: *See*—
Igarashi, Kikuo; Irisawa, Junji; and Honma, Tsunetoshi, 4,200,628, Cl. 424-180.000.

Irwin, Clarence C.; and Manz, David F., to General Motors Corporation. Linear locking seat belt retractor. 4,200,308, Cl. 280-804.000.

Isacoff, Eric G.: *See*—
Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., 4,200,695, Cl. 521-28.000.

Ishida, Michiyasu: *See*—
Watanabe, Shigeru; Ishida, Michiyasu; and Iwasaki, Hideo, 4,199,829, Cl. 5-81.00R.

Ishida, Yasuhiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Split operation type multi-cylinder internal combustion engine. 4,200,083, Cl. 123-198.00F.

Ishigaki Kiko Co., Ltd.: *See*—
Iwatani, Akitoshi; and Takuma, Masataro, 4,200,532, Cl. 210-151.000.

Ishiguro, Toshio: *See*—
Tagashira, Satoshi; Motegi, Akira; and Ishiguro, Toshio, 4,200,390, Cl. 355-14.00R.

Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, to Copal Company Limited. Exposure controlling circuit for electric shutter. 4,200,375, Cl. 354-50.000.

Ishihara, Hideo; and Seki, Norio, to Kokusai Denshin Denwa Kabushiki Kaisha. Logical operation circuit using magnetic bubbles. 4,200,924, Cl. 365-5.000.

Ishihara, Masao: *See*—
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.

Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya. Hitoshi, to Daicel Ltd. Semipermeable membrane of phenoxy resin containing sulfuric acid groups or salts thereof. 4,200,726, Cl. 528-99.000.

Ishii, Shigetaka; Kiho, Keiichi; Sugiyama, Shinichi; and Sugimoto, Hiroshi, to Kikkoman Shoyu Co., Ltd. Novel pectin esterase, process for its production, and process for producing demethoxylated pectin by the use of said pectin esterase. 4,200,694, Cl. 435-101.000.

Ishikawa, Kazuo: *See*—
Sato, Yasuhisa; Tsuji, Sadahiko; Ishikawa, Kazuo; and Matsumura, Susumu, 4,200,380, Cl. 354-219.000.

Ishikawa, Youhei: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,200,847, Cl. 333-125.000.

Ishizaka, Sunao; and Araki, Yoshitaka, to Nippon Kogaku K.K. Photographing mode switching mechanism in camera. 4,200,381, Cl. 354-289.000.

Isobe, Mitsuhide, to Shimano Industrial Company Limited. Front derailleur. 4,199,997, Cl. 74-217.00B.

Isobe, Mitsuhide, to Shimano Industrial Company Limited. Front derailleur. 4,199,998, Cl. 74-217.00B.

Itaya, Hideo, to Olympus Optical Co., Ltd. Photo eyepiece for microscopes. 4,200,357, Cl. 350-175.00E.

Itaya, Kazunori: *See*—
Iiyama, Masahiko; and Itaya, Kazunori, 4,200,596, Cl. 261-65.000.

ITI Limited: *See*—
Mougin, Georges L., 4,200,409, Cl. 405-52.000.

Ito, Shinobu: *See*—
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Ito, Yoji: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,200,847, Cl. 333-125.000.

Itoh, Junichi: *See*—
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,200,711, Cl. 525-387.000.

Iwama, Hideto; and Toyama, Masamichi, to Canon Kabushiki Kaisha. Automatic aperture presetting and exposure control device for camera. 4,200,372, Cl. 354-43.000.

Iwasaki, Hideo: *See*—
Watanabe, Shigeru; Ishida, Michiyasu; and Iwasaki, Hideo, 4,199,829, Cl. 5-81.00R.

Iwatani, Akitoshi; and Takuma, Masataro, to Ishigaki Kiko Co., Ltd. Wastewater treatment apparatus. 4,200,532, Cl. 210-151.000.

Izard, Charles B.: *See*—
Bartlett, Oliver H., Jr.; and Izard, Charles B., 4,200,394, Cl. 356-347.000.

J B Development Corporation: *See*—
Edward, John C., 4,199,976, Cl. 73-81.000.

J. Bobst & Fils, S.A.: *See*—
Schneider, Bruno; Nigg, Fritz; and Risse, Jean-Claude, 4,200,246, Cl. 242-67.400.

J. E. Myles, Inc.: *See*—
Graczyk, Edward W., 4,199,993, Cl. 73-744.000.
Myles, J. Edgar, 4,199,992, Cl. 73-744.000.

Jaccard, Andre R., to Jaccard Corporation. Hand meat tenderizer. 4,199,841, Cl. 17-30.000.

Jaccard Corporation: *See*—
Jaccard, Andre R., 4,199,841, Cl. 17-30.000.

Jacino, Anthony: *See*—
Jacino, Gerald; and Jacino, Anthony, 4,200,478, Cl. 156-94.000.

Jacino, Gerald; and Jacino, Anthony. Glass break repair apparatus and method. 4,200,478, Cl. 156-94.000.

Jackovitz, John F.; and Pantier, Earl A., to Westinghouse Electric Corp. Catalyses of uranium oxidation. 4,200,337, Cl. 299-5.000.

Jackson, Douglas: *See*—
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,200,052, Cl. 114-230.000.

Jackson, Leigh F.: *See*—
Bains, Gurdip S.; Martin, Niles J.; and Jackson, Leigh F., 4,199,907, Cl. 52-125.000.

Jagenberg-Werke Atkiengesellschaft: *See*—
Hoveler, Egon, 4,200,483, Cl. 156-487.000.

James, David B.: *See*—
Wetton, Raymond E.; and James, David B., 4,200,701, Cl. 525-4.000.

James, Forrest H., Jr.; and Silberman, Ira J., to Diversified Products Corporation. Method and apparatus for filling containers with a relatively viscous material. 4,199,912, Cl. 53-127.000.

Janome Sewing Machine Co., Ltd.: *See*—
Makabe, Hachiro; and Watanabe, Kazuo, 4,200,048, Cl. 112-158.00E.

Janssen, Peter J. H., to U.S. Philips Corporation. Color television CRT beam current correction circuit. 4,200,882, Cl. 358-29.000.

Janssen Pharmaceutica, N.V.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,200,641, Cl. 424-267.000.

Japan Exlan Company Limited: *See*—
Komiya, Shigeo, 4,200,563, Cl. 260-29.6SQ.

Jasch, Erich; and Kasper, Paul, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cooling tower. 4,199,906, Cl. 52-63.000.

Jaschkowitz, Herbert. Centrifuge rotor. 4,200,223, Cl. 233-26.000.

Jemar, Inc.: *See*—
Bosley, Thurston N., 4,200,289, Cl. 273-109.000.

Jenkins, Alan N.; and Taylor, Michael, to Helmets Limited. Disengageable helmet visor clamp. 4,199,823, Cl. 2-424.000.

Jenkinson, Frederic W.: *See*—
Gearheart, John D.; and Jenkinson, Frederic W., 4,200,876, Cl. 346-49.000.

Jenko, Branko; Langof, Igor; and Habjan, Joza, to LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o. Process for preparing N-cyano-N'methyl-N''-{2-[(4-methyl-5-imidazolyl)-methylthio]-ethyl} guanidine. 4,200,761, Cl. 548-342.000.

Johansen, Richard W., to CF Industries, Inc. Ammonium nitrate particle removal apparatus. 4,200,616, Cl. 422-169.000.

Johansson, August V.; and Schneider, Joseph D., to General Electric Company. Overload detecting scheme for an electric propulsion system for traction vehicles. 4,200,832, Cl. 322-59.000.

Johansson, Hans: *See*—
Sunden, Olof; Johansson, Hans; Ahlberg, Hakan B.; and Karlsson, Per-Arne I., 4,200,548, Cl. 252-135.000.

John Labatt Limited: *See*—
Ladbrooke, Brian D.; Quick, Gary R.; and Singer, Norman S., 4,200,569, Cl. 260-112.00G.

Johns-Manville Corporation: *See*—
Price, George B.; and Kielmeyer, William H., 4,200,485, Cl. 423-335.000.

Johnson, Bruce K., to Polaroid Corporation. Photographic camera apparatus for visually indicating the status of an exposure trim mechanism. 4,200,373, Cl. 354-53.000.

Johnson, Charles E., to Buffalo Weaving and Belting Co. Synthetic organic polymeric plastic sling protected by vulcanized or cured elastomeric laminate at load contacting area thereof. 4,200,325, Cl. 294-74.000.

Johnson, Earl W.; Reider, Malcolm J.; Anewalt, Robert; and Kring, Harry J., to Gerber Products Company. Process for treating waste water. 4,200,526, Cl. 210-23.00H.

Johnson, Leighton C., to Miles Laboratories, Inc. Segmented platen for applying liquids to a flat surface. 4,200,056, Cl. 118-401.000.

Johnson, Matthey & Co., Limited: *See*—
Hignett, Rosemary R.; and Davidson, Peter J., 4,200,591, Cl. 260-604.0HF.
Hignett, Rosemary R.; and Davidson, Peter J., 4,200,592, Cl. 260-604.0HF.

Johnston, Bobby M.; and Pope, Billy C., to Talco Aluminum Company, Inc. Storm window unit. 4,199,900, Cl. 49-404.000.

Jones, Clarence R.: *See*—
Foster, John W.; and Jones, Clarence R., 4,200,152, Cl. 166-271.000.

Jones, Graham J.: *See*—
Muchow, John D.; Jones, Graham J.; and Slegers, Maurice, 4,199,834, Cl. 15-104.06A.

Jones & Laughlin Steel Corporation: *See*—
Gerding, Charles C., 4,200,499, Cl. 202-248.000.

Jones, Max E.: *See*—
Chitwood, Ernest L.; and Jones, Max E., 4,200,131, Cl. 150-1.50R.

Jonsson, Kjartan A., to Sun-Econ, Inc. Heat extraction or reclamation apparatus for refrigerating and air conditioning systems. 4,199,955, Cl. 62-79.000.

Jos. Schneider & Co., Optische Werke Kreuznach: *See*—
Holderbaum, Karl H., 4,200,377, Cl. 354-195.000.

Josephson, Donald G.; and Sorli, Duncan C., to Polaroid Corporation. Photographic apparatus for coupling together elements of a self-developing film unit. 4,200,384, Cl. 354-304.000.

Joy, David C.; and Schmidt, Paul H., to Bell Telephone Laboratories, Incorporated. Low work function hexaboride electron source. 4,200,555, Cl. 252-521.000.

JRC Products Inc.: *See*—
Ryan, Ralph L., 4,200,301, Cl. 279-2.00A.

Jurgens, Rainer: *See*—
Peschel, Eberhard; Rathkamp, Hermann; Katzorke, Klaus; and Jurgens, Rainer, 4,200,159, Cl. 175-329.000.

Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo: *See*—
Yokobayashi, Koji; and Sugimoto, Toshiyuki, 4,200,693, Cl. 435-101.000.

Kabushiki Kaisha Yamazaki Tekkosho: *See*—
Momoi, Shoji; and Mitsuguchi, Yukio, 4,200,013, Cl. 82-2.500.

Kaga, Takashi, to Tomy Kogyo Co., Inc. Game in which objects are discharged from a receptacle. 4,200,284, Cl. 273-1.00R.

Kaimann, Walter; and Brachthauser, Karl-Heinz, to Projektierung Chemische Verfahrenstechnik GmbH. Gasification of solid fuel. 4,200,438, Cl. 48-73.000.

Kalinichenko, Anatoly Y., to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia. Digital control device for thyristol-pulse d.c. regulators. 4,200,825, Cl. 318-312.000.

Kalinichenko, Anatoly Y.; Vlasov, Valentin M.; and Kiksman, Grigory E., to Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia. Device for digital control of polyphase thyristor-pulse converter. 4,200,908, Cl. 363-124.000.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Dye composition containing oxidation dye and diphenylamine. 4,200,432, Cl. 8-10.200.

Kaman, Charles H. Stringed musical instrument neck and body structure. 4,200,023, Cl. 84-293.000.

Kamiya, Masashi: *See*—
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.

Kanaikin, Mikhail M.: *See*—
Koshevoi, Anatoly A.; Kanaikin, Mikhail M.; Lapy, Viktor J.; and Chernov, Boris P., 4,199,874, Cl. 35-10.400.

Kanbier, Dirk: *See*—
Kwant, Pieter B.; Kanbier, Dirk; Tjan, Petrus W. H. L.; and Akbar, Mohammed, 4,200,519, Cl. 208-77.000.

Kaneda, Motoshiro: *See*—
Anahara, Ryoji; Sato, Koichi; Kaneda, Motoshiro; and Saito, Mitsuo, 4,200,835, Cl. 324-51.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Yamazaki, Kaoru; Kurioka, Shunichiro; Hatano, Takashi; Asada, Sadame; and Yasuda, Mariko, 4,200,719, Cl. 526-220.000.

Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,200,466, Cl. 430-566.000.

Kannard, Melvin W.: *See*—
Babler, Richard G.; Stinchfield, George V.; and Kannard, Melvin W., 4,200,408, Cl. 404-83.000.

Kapell, Gerhard: *See*—
Berndt, Gerhard; Kapell, Gerhard; Schummer, Anton; and Hansen, Uwe J., 4,200,265, Cl. 266-212.000.

Karl Schmidt GmbH: *See*—
Korn, Hans; Grothe, Klaus; and Bauer, Wolfgang, 4,200,309, Cl. 280-750.000.

Karlsson, Per-Arne I.: *See*—
Sunden, Olof; Johansson, Hans; Ahlberg, Hakan B.; and Karlsson, Per-Arne I., 4,200,548, Cl. 252-135.000.

Karpati, Egon: *See*—
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.

Karr, Andrew E., to Chem-Pro Equipment Corp. Liquid extraction process and apparatus for accomplishing the same. 4,200,525, Cl. 210-21.000.

Kasahara, Nobuyoshi; and Nonumura, Koutaro, to Mitsui Mining & Smelting Co., Ltd. Process for dyeing aluminum-containing zinc-based alloys. 4,200,475, Cl. 148-6.100.

Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, to Data General Corporation. Head adjustment mechanism for rigid magnetic disc memory apparatus. 4,200,894, Cl. 360-106.000.

Kashigi, Kazuo: *See*—
Inaba, Masao; and Kashigi, Kazuo, 4,200,890, Cl. 358-183.000.

Kashihama, Tomio: *See*—
Suzuki, Etsuji; Yasue, Itaru; and Kashihama, Tomio, 4,200,393, Cl. 356-73.000.

Kasper, Leslie J., to Eaton Corporation. Load sensing control for hydraulic system. 4,199,942, Cl. 60-420.000.

Kasper, Paul: *See*—
Jasch, Erich; and Kasper, Paul, 4,199,906, Cl. 52-63.000.
Katner, Allen S., to Eli Lilly and Company. 7[2-(2-Aminothiazol-4-yl)-2-alkoxyimino]acetamido 3[4-alkyl-5-oxo-6-hydroxy-3,4 dihydro 1,2,4-triazin 3-yl]thio methyl cephalosporins. 4,200,745, Cl. 544-21.000.
Katou, Hiromi: *See*—
Kosuda, Tooru; Ohashi, Michihiro; and Katou, Hiromi, 4,200,074, Cl. 123-139.0BG.
Katz, Gerson. Device for displaying an improved periodic table of the elements. 4,199,876, Cl. 35-18.00R.
Katzman, Ellen F.: *See*—
Katzman, Sandra J.; and Katzman, Ellen F., 4,200,658, Cl. 426-512.000.
Katzman, Sandra J.; and Katzman, Ellen F. Method for making candy in detailed designs. 4,200,658, Cl. 426-512.000.
Katzorke, Klaus: *See*—
Peschel, Eberhard; Rathkamp, Hermann; Katzorke, Klaus; and Jurgens, Rainer, 4,200,159, Cl. 175-329.000.
Kaufman, Samuel. Underdrain for filter tanks. 4,200,536, Cl. 210-279.000.
Kauhl, Guntiier; Pflug, Hannes; and Steinke, Leo, to Robert Bosch GmbH. Glow plug structure. 4,200,077, Cl. 123-145.00A.
Kauschke, Wolfgang, to Glacier GmbH-Deva Werke. Bearing sealing arrangement. 4,200,341, Cl. 308-3.500.
Kawai, Hisasi: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,200,843, Cl. 328-142.000.
Kawamura, Kazumitu; and Yahata, Mitsuru, to Tokyo Shibaura Electric Co., Ltd. Pulsate X-ray generating apparatus. 4,200,795, Cl. 250-402.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Ueda, Hiroshi, 4,200,242, Cl. 241-183.000.
Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,200,466, Cl. 430-566.000.
Kazaroff, John M.: *See*—
Fortini, Anthony; and Kazaroff, John M., 4,199,937, Cl. 60-267.000.
Keeran, William C.; and Lakickas, Edward, to Safety Products. Strobe lamp warning apparatus. 4,200,823, Cl. 315-241.00R.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Cremer, Heinz P.; and Werner, Paul, 4,200,333, Cl. 297-362.000.
Kelly, Patrick N. Door-operated boarding step for trucks. 4,200,303, Cl. 280-166.000.
Kelly, Robert C., to Upjohn Company, The. Enlarged-hetero-ring prostacyclin analogs. 4,200,739, Cl. 542-426.000.
Kelsey-Hayes Company: *See*—
Evans, Anthony C.; Goering, Karl; and Rinker, Kurt H., 4,200,173, Cl. 188-73.300.
Kendall, Arthur G.: *See*—
Austin, Milton; and Kendall, Arthur G., 4,199,890, Cl. 43-43.120.
Kendall Company, The: *See*—
McWhorter, Daniel M., 4,200,112, Cl. 128-761.000.
Kennedy, Alvin B., Jr. Apparatus for transporting material separated from a flowing fluid. 4,200,535, Cl. 210-241.000.
Kennedy, Edward S., to Group Industries Incorporated. Barrel ring lock assembly. 4,200,316, Cl. 292-256.670.
Kennis, Ludo E. J.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M Th., 4,200,641, Cl. 424-267.000.
Keondjian, Hagop; and Bugbee, Stanley W., to H. K. Productions Limited. Display and reproduction of color. 4,200,365, Cl. 353-29.000.
Kephart, John F.: *See*—
Stark, Eugene E., Jr.; Kephart, John F.; Leland, Wallace T.; and Reichelt, Walter H., 4,200,846, Cl. 331-94.50R.
Kepinski, Marek: *See*—
Engel, Zbigniew; Kepinski, Marek; and Grabowski, Idzi, 4,199,969, Cl. 72-76.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Becker, Veit; Feinendegen, Ludwig; and Pollermann, Max, 4,200,803, Cl. 250-505.000.
Kersten, Siegfried P.: *See*—
Panek, Edward J.; Moll, Werner O.; Bergman, Lee H.; and Kersten, Siegfried P., 4,200,501, Cl. 203-7.000.
Ketchum Laboratories Inc.: *See*—
Denniston, George C., Jr., 4,200,088, Cl. 128-1.00R.
Keyes, Melvin H.; and Moore, Garry L., to Owens-Illinois, Inc. Method of preparing a rapidly soluble and machine handleable particulate composite and product. 4,200,238, Cl. 241-21.000.
Kezran, Mitchell, to Precision Industries, Inc. Tool with interchangeable insert. 4,200,416, Cl. 407-108.000.
Khakimov, Anas N.: *See*—
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.
Kidani, Yoshinori; and Noji, Masahide, to Kidani, Yoshinori. New platinum complex. 4,200,583, Cl. 260-345.70R.
Kielersreiter, Fritz; and Rouleaux, Hubertus H., to Ruti Machinery Works Ltd.; and Ruti-Te Strake B.V. Method for the manufacture of profiled reed blades for loom reeds. 4,199,971, Cl. 72-336.000.
Kielmeyer, William H.: *See*—
Price, George B.; and Kielmeyer, William H., 4,200,485, Cl. 423-335.000.
Kienbaum, Heinz: *See*—
Laubach, Winfried; Kienbaum, Heinz; and Thomas, Rolf, 4,200,400, Cl. 366-233.000.
Kiencke, Uwe: *See*—
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, 4,200,007, Cl. 74-859.000.
Kienzle Apparate GmbH: *See*—
Fichter, Manfred, 4,200,812, Cl. 307-265.000.
Kiho, Keiichi: *See*—
Ishii, Shigetaka; Kiho, Keiichi; Sugiyama, Shinichi; and Sugimoto, Hiroshi, 4,200,694, Cl. 435-101.000.
Kikkoman Shoyu Co., Ltd.: *See*—
Ishii, Shigetaka; Kiho, Keiichi; Sugiyama, Shinichi; and Sugimoto, Hiroshi, 4,200,694, Cl. 435-101.000.
Kiksman, Grigory E.: *See*—
Kalinichenko, Anatoly Y.; Vlasov, Valentin M.; and Kiksman, Grigory E., 4,200,908, Cl. 363-124.000.
Kimata, Kei; and Nakazeki, Tsugito, to NTN Toyo Bearing Company Limited. Area type flow rate measuring device. 4,200,120, Cl. 137-613.000.
Kimble, Harry J.; and Roessler, David M., to General Motors Corporation. Resonant optoacoustic spectroscopy apparatus. 4,200,399, Cl. 356-437.000.
King Industries, Inc: *See*—
Calbo, Leonard J., 4,200,729, Cl. 525-398.000.
King, John B., to Hutchens Industries Inc. Tandem axle suspension with improved equalizer pivot assembly. 4,200,267, Cl. 267-52.000.
Kingsley, Jack D.: *See*—
Yang, Kei-Hsiung; and Kingsley, Jack D., 4,200,790, Cl. 250-315.200.
Kinner, George H.; and Lancaster, John K., to National Research Development Corporation. Bearing materials. 4,200,541, Cl. 252-12.200.
Kintner, Paul M., to Eaton Corporation. Memory programming control system for storing a wire number program of a ladder diagram for a programmable controller. 4,200,914, Cl. 364-900.000.
Kirby, William L.: *See*—
Cook, Norman E.; and Kirby, William L., 4,200,080, Cl. 123-179.0BG.
Kiss, Bela: *See*—
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.
Kissell, Fred N.: *See*—
Matta, Joseph E.; and Kissell, Fred N., 4,200,036, Cl. 98-50.000.
Kitagawa, Shunji: *See*—
Kiyota, Kohei; Ueda, Hiroo; Kitagawa, Shunji; and Tasai, Kunihiko, 4,200,461, Cl. 430-91.000.
Kitamoto, Tatsuji: *See*—
Sasazawa, Koji; Komine, Shigeo; Kitamoto, Tatsuji; and Akashi, Goro, 4,200,680, Cl. 428-403.000.
Kitko, David J., to Procter & Gamble Company, The. Method for sanitizing toilets. 4,200,606, Cl. 422-37.000.
Kiyokawa, Hiroyuki: *See*—
Okochi, Kazuo; and Kiyokawa, Hiroyuki, 4,200,434, Cl. 23-230.00B.
Kiyota, Kohei; Ueda, Hiroo; Kitagawa, Shunji; and Tasai, Kunihiko, to Fujitsu Limited. Xanthene type acid dye and a base dye-sensitized zinc oxide photoconductive element. 4,200,461, Cl. 430-91.000.
Kizaki, Jiro: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,200,205, Cl. 220-20.500.
Klecker, Gary J.: *See*—
Heyer, Raymond F.; and Klecker, Gary J., 4,199,835, Cl. 15-209.00B.
Klein, Levi: *See*—
Cohen, Shlomo; Gollop, Zeev; and Klein, Levi, 4,200,656, Cl. 426-331.000.
Klein, Max. Micro-bits of expanded flexible polyurethanes. 4,200,679, Cl. 428-402.000.
Kleiner, Richard N.: *See*—
Dziedzic, Chester J.; Kleiner, Richard N.; and Cleveland, Joseph J., 4,200,604, Cl. 264-101.000.
Kleinknecht, Hans P.; and Bosenberg, Wolfram A., to RCA Corporation. Optically testing the lateral dimensions of a pattern. 4,200,396, Cl. 356-384.000.
Klenk, Emil; and Hornung, Adolf, to Maschinenbau Oppenweiler GmbH. Flat pile-automatic sheet feeder. 4,200,277, Cl. 271-90.000.
Klomp, Franciscus M., to U.S. Philips Corporation. Carton containing an article packaged therein. 4,200,192, Cl. 206-418.000.
Klootwyk, Ronald I.; and Pagendarm, Lawrence J., to Continental Group, Inc., The. Power module with gas pressurized deformable casing side panels. 4,200,685, Cl. 429-70.000.
Kluczynski, Achim; and Altmann, Erik, to AGFA-Gevaert, A.G. Cassette for roll films, with a catch for preventing drawing in of the end of the film. 4,200,247, Cl. 242-71.200.
Klungseth, Erling: *See*—
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.
Knaak, Rudiger, to Koppers-Wistra Offenbau GmbH. Roller, particularly for a roller hearth furnace. 4,200,431, Cl. 432-236.000.
Knape, Richard S., to General Motors Corporation. Fuel injector nozzle. 4,200,231, Cl. 239-94.000.
Knauer, Karl; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Transversal filter. 4,200,848, Cl. 333-165.000.

Knazek, Richard A.; Gullino, Pietro M.; and Frankel, David S., to United States of America, America. Method of cell culture using a dual circuit, woven artificial capillary bundle. 4,200,689, Cl. 435-2.000.

Knoche, Bodo. Breast prosthesis. 4,199,825, Cl. 3-36.000.

Knops, Hans-Joachim; Heine, Hans-Georg; Draber, Wilfried; and Brandes, Wilhelm, to Bayer Aktiengesellschaft. Combating fungi with spiro derivatives of 3-(3,5-dihalogenophenyl)-oxazolidine-2,4-diones. 4,200,643, Cl. 424-272.000.

Knorr, Gunter, to Claudius Peters AG. Two part grate for stokers with reciprocating grate plates. 4,200,047, Cl. 110-281.000.

Kobayashi, Shozaburo; and Yamauchi, Kenji, to Dodwell & Company Limited. Apparatus for detecting the level of liquid in a tank. 4,199,983, Cl. 73-302.000.

Kobayashi, Tetsuji: *See*—
Tanaka, Shikei; Kobayashi, Tetsuji; Matsuo, Noboru; and Takahashi, Haruo, 4,200,814, Cl. 307-309.000.

Kobe Steel, Limited: *See*—
Yanagi, Chota, 4,200,531, Cl. 210-137.000.

Kodama, Roy K., to Gould Inc. Isolation diaphragm assembly for pressure transducers and method of manufacture. 4,199,991, Cl. 73-706.000.

Kodama, Yutaka: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Koehler, Raymond A., to UOP Inc. Method of attaching fittings to a cylindrical well screen. 4,200,218, Cl. 228-165.000.

Koenig, Thomas A.; and Benasutti, Roger, to Conwed Corporation. Compact portable indirect lighting fixture with acoustical control. 4,200,903, Cl. 362-134.000.

Kohama, Tokio: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,200,843, Cl. 328-142.000.

Kohn, Gustave K.: *See*—
Henrick, Clive A.; and Kohn, Gustave K., 4,200,758, Cl. 548-312.000.

Kohnert, Howard W. Burial urn. 4,199,848, Cl. 27-1.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Ishihara, Hideo; and Seki, Norio, 4,200,924, Cl. 365-5.000.

Kolb, Robert C., to Valley Forge Stove Co. Wood burning stove and fireplace. 4,200,086, Cl. 126-66.000.

Kolberg, Reiner: *See*—
Guenzel, Peter; Rosskamp, Guenter; Kolberg, Reiner; and Porep, Hans-Juergen, 4,200,099, Cl. 128-266.000.

Koliba, Melvin J.; and Napel, Larry P., to General Motors Corporation. Chock device for a transporter. 4,200,046, Cl. 410-94.000.

Komander, Gerhard: *See*—
Hilpert, Wolfgang; Komander, Gerhard; and Stotz, Manfred, 4,199,977, Cl. 73-119.00A.

Komatsu, Hiroaki; and Oka, Tsumoru, to Alps Electric Co., Ltd. Switch. 4,200,773, Cl. 200-11.00R.

Komine, Shigeo: *See*—
Sasazawa, Koji; Komine, Shigeo; Kitamoto, Tatsuji; and Akashi, Goro, 4,200,680, Cl. 428-403.000.

Komiya, Shigeo, to Japan Exlan Company Limited. Method of producing aqueous polymer emulsion with improved stability. 4,200,563, Cl. 260-29.6SQ.

Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, to Sandoz Ltd. Aqueous preparations for treating textile substrates comprising regenerated cellulose. 4,200,564, Cl. 260-29.40R.

Kondo, Kenji: *See*—
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,199,938, Cl. 60-274.000.

Konetehdas Maskinfabrik Norcar Ky Kb: *See*—
Carlsson, Kaj, 4,200,315, Cl. 280-492.000.

Konishiriku Photo Ind., Co., Ltd.: *See*—
Tagashira, Satoshi; Motegi, Akira; and Ishiguro, Toshio, 4,200,396, Cl. 355-14.00R.

Konishiroku Photo Industry Co., Ltd.: *See*—
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,200,466, Cl. 430-566.000.
Tarumi, Noriyoshi; and Ueno, Kenji, 4,199,985, Cl. 73-351.000.

Koontz, Harry S., to PPG Industries, Inc. Gas hearth electrical heating supplement and method of operation. 4,200,446, Cl. 65-25.00A.

Koppers Company, Inc.: *See*—
Arsenault, Robert D., 4,199,870, Cl. 34-24.000.

Koppers-Wistra Offenbau GmbH: *See*—
Knaak, Rudiger, 4,200,431, Cl. 432-236.000.

Korn, Hans; Grothe, Klaus; and Bauer, Wolfgang, to Karl Schmidt GmbH. Safety steering wheel for motor vehicles. 4,200,309, Cl. 280-750.000.

Koshelev, Nikolai N.: *See*—
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Koshevoi, Anatoly A.; Kanaikin, Mikhail M.; Lapy, Viktor J.; and Chernov, Boris P. Target simulator. 4,199,874, Cl. 35-10.400.

Koshevoi, Anatoly A.: *See*—
Davidjuk, Alexandr D.; Koshevoi, Anatoly A.; Lapy, Viktor J.; and Frankov, Vasily N., 4,200,929, Cl. 364-200.000.

Kostka, Anton: *See*—
Vagac, Svetozar; Prochazka, Bretislav; Mueller, Jiri; Kostka, Anton; and Carsky, Milan, 4,200,486, Cl. 162-8.000.

Kostrzewa, Michael: *See*—
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,200,558, Cl. 260-17.00A.

Kosuda, Tooru; Ohashi, Michihiro; and Katou, Hiromi, to Nippon Soken, Inc. Fuel injection system for an internal combustion engine. 4,200,074, Cl. 123-139.0BG.

Kotcharian, Michel, to Technigaz. Thermally insulating, fluid-tight composite wall, prefabricated elements for constructing the same and method of constructing said wall. 4,199,909, Cl. 52-410.000.

Koval, Grigory I.: *See*—
Vydrin, Vladimir N.; Berezin, Evgeny N.; Tischenko, Oleg I.; Dremin, Vladimir G.; and Koval, Grigory I., 4,199,970, Cl. 72-186.000.

Koyama, Kenichi: *See*—
Nomura, Harehiko; Koyama, Kenichi; and Terao, Kazuhiko, 4,200,767, Cl. 174-126.00S.

Kraftwerk Union Aktiengesellschaft: *See*—
Sterk, Zvonimir; Sawitzki, Martin; and Grimm, Heinz, 4,200,061, Cl. 122-32.000.

Kragen, Horst: *See*—
Brigand, Gerard; Kragen, Horst; and Rizzotti, Robert, 4,200,661, Cl. 426-573.000.

Krajewski, Richard M.; and Erickson, Robert E., to Dow Chemical Company, The. Method for removing paint from a substrate. 4,200,671, Cl. 427-154.000.

Kraushaar, Jonathan M.; and Mina, Ramses R. Traffic measuring device based on state transitions. 4,200,771, Cl. 179-8.00A.

Krauss-Maffei AG: *See*—
Fink, Eugen; and Krennwallner, Eberhard, 4,200,529, Cl. 210-73.00R.

Krennwallner, Eberhard: *See*—
Fink, Eugen; and Krennwallner, Eberhard, 4,200,529, Cl. 210-73.00R.

Kress, Dieter; and Haberle, Friedrich, to Mapal Fabrik fur Prazisionswerkzeuge KG. Floating reamer. 4,200,418, Cl. 408-143.000.

Kring, Harry J.: *See*—
Johnson, Earl W.; Reider, Malcolm J.; Anewalt, Robert; and Kring, Harry J., 4,200,526, Cl. 210-23.00H.

Krueger, William R.: *See*—
Cavil, David T.; and Krueger, William R., 4,200,078, Cl. 123-148.0CC.

Kubo, Masyoshi; Nakanishi, Michio; and Watanabe, Shoji, to Daicel Ltd. Process for preparing water-soluble alkyd resins. 4,200,560, Cl. 260-22.0EP.

Kubota, Masayuki: *See*—
Sato, Yoshihiko; and Kubota, Masayuki, 4,200,177, Cl. 198-335.000.

Kuchuk, Ivan A.: *See*—
Volman, Mikhail Y.; Grinshtein, Vladimir Y.; Zhukov, Mikhail L.; and Kuchuk, Ivan A., 4,200,899, Cl. 361-333.000.

Kuhar, Eugene; and Smith, Donald L., to International Business Machines Corporation. Operator controlled programmable keyboard apparatus. 4,200,913, Cl. 364-900.000.

Kuhn, Patrick: *See*—
Schmidt, Donald K.; and Kuhn, Patrick, 4,200,255, Cl. 248-289.00A.

Kujirai, Tatsuo: *See*—
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Kulisch, Volker W.: *See*—
Peterlein, Karl; Schulde, Felix; Diedrich, Klaus M.; and Kulisch, Volker W., 4,200,559, Cl. 260-17.4ST.

Kumagai, Takasuke: *See*—
Takahashi, Kenji; Kumagai, Takasuke; and Takaichi, Kazuyoshi, 4,200,075, Cl. 123-140.0FG.

Kunze, Bernhard: *See*—
Wittkopp, Helmut; and Kunze, Bernhard, 4,200,012, Cl. 82-1.00C.

Kurioka, Shunichiro: *See*—
Yamazaki, Kaoru; Kurioka, Shunichiro; Hatano, Takashi; Asada, Sadame; and Yasuda, Mariko, 4,200,719, Cl. 526-220.000.

Kurttila, Kenneth R.: *See*—
Flor, Lawrence A.; and Kurttila, Kenneth R., 4,200,675, Cl. 428-43.000.

Kusters, Eduard: *See*—
Ahrweiler, Karl-Heinz, 4,200,430, Cl. 425-81.100.

Kutsuyama, Hiroshi: *See*—
Nagata, Yoshinosuke; Kutsuyama, Hiroshi; Yamada, Makoto; and Tsukamoto, Kazuyoshi, 4,200,841, Cl. 455-169.000.

Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., to Moskovsky Institut Neftekhimicheskoi I Gazovoi Promyshlennosti Imeni I.M. Gubkina. Method and device for regulating parameters of thermal cycles in electroslag welding. 4,200,782, Cl. 219-73.100.

Kwant, Pieter B.; Kanbier, Dirk; Tjan, Petrus W. H. L.; and Akbar, Mohammed, to Shell Oil Company. Process for the preparation of gas oil. 4,200,519, Cl. 208-77.000.

Kyodo Insatsu Kabushiki Kaisha: *See*—
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Kyri, Hans; Lauss, Hans-Dietrich; and Schneider, Siegfried, to Bayer Aktiengesellschaft. Purification of ammonium fluoride solutions. 4,200,622, Cl. 423-471.000.

Kytta, Oswald O., to Bendix Corporation, The. Valve travel mechanism. 4,200,001, Cl. 74-478.000.

La Corporation Inglasco Ltee: *See*—
Ardell, William E.; Burchmore, William A.; Drolet, Leo P.; and Drolet, Michel, 4,200,479, Cl. 156-154.000.

Labombarde, Raymond A. Box blank feed, transfer and glueing control apparatus. 4,200,033, Cl. 93-49.00R.

Laboratoire Aguettant: *See*—
Aguettant, Georges, 4,200,209, Cl. 222-541.000.

Ladbrooke, Brian D.; Quick, Gary R.; and Singer, Norman S., to John Labatt Limited. Wheat-based lipoprotein complexes and methods of making and using same. 4,200,569, Cl. 260-112.00G.

Laimer, Friedrich, to Voest-Alpine Aktiengesellschaft. Filling stand arrangement for a metallurgical ladle. 4,200,263, Cl. 266-142.000.

Lakickas, Edward: *See*—
Keeran, William C.; and Lakickas, Edward, 4,200,823, Cl. 315-241.00R.

Lamaze, Airy P., to Ugine Aciers. Process for recovering acids and zirconium contained in pickling solutions. 4,200,612, Cl. 423-70.000.

Lambert, Lloyd J., Jr. Leg extension, leg curl, hip, thigh, back and buttocks machine. 4,200,279, Cl. 272-118.000.

Lamlee, Stewart. Game board and game pieces useable therewith. 4,200,298, Cl. 273-236.000.

Lamort, Jean P. J., to E. et M. Lamort. Apparatus for the purification of paper pulp. 4,200,537, Cl. 210-415.000.

Lamoureux, William R.; Martin, William J.; and Trushell, James B., to International Business Machines Corporation. Buffered high frequency plasma display system. 4,200,868, Cl. 340-713.000.

Lancaster, John K.: *See*—
Kinner, George H.; and Lancaster, John K., 4,200,541, Cl. 252-12.200.

Lang, Robert J., to Exxon Research & Engineering Co. Gasification process using ion-exchanged coal. 4,200,439, Cl. 48-210.000.

Lange, Richard L. Riser neck for molding castings. 4,200,142, Cl. 164-359.000.

Langof, Igor: *See*—
Jenko, Branko; Langof, Igor; and Habjan, Joza, 4,200,761, Cl. 548-342.000.

Lantos, Ivan: *See*—
Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, 4,200,738, Cl. 536-121.000.

Lantry, Gerald F.: *See*—
Chase, Charles R.; and Lantry, Gerald F., 4,200,206, Cl. 222-144.500.

Lapy, Viktor J.: *See*—
Davidjuk, Alexandr D.; Koshevoi, Anatoly A.; Lapy, Viktor J.; and Frankov, Vasily N., 4,200,929, Cl. 364-200.000.
Koshevoi, Anatoly A.; Kanaikin, Mikhail M.; Lapy, Viktor J.; and Chernov, Boris P., 4,199,874, Cl. 35-10.400.

Larco, Societe Miniere et Metallurgique de Larymna S.A.: *See*—
Hatzinicolaides, John A.; and Papamantellos, Demetrios C., 4,200,453, Cl. 75-52.000.

Large, Michael S.; and Smith, Leslie H., to Imperial Chemical Industries Limited. Alkanolamine derivatives. 4,200,652, Cl. 424-321.000.

Larsen, Morrie E.; and Hackstaff, Alain, to Summa Corporation. Remote radio selector with manual override. 4,200,837, Cl. 455-92.000.

Larson, Charles R.: *See*—
Van Nocker, Melvin; and Larson, Charles R., 4,200,185, Cl. 198-718.000.

Lask, Helmut: *See*—
Holst, Arno; Kostrzewa, Michael; and Lask, Helmut, 4,200,558, Cl. 260-17.00A.

Laubach, Winfried; Kienbaum, Heinz; and Thomas, Rolf, to Gutehoffnungshutte Sterkrade A.G. Mixing car for transporting molten metals. 4,200,400, Cl. 366-233.000.

Lauder, Alan, to Du Pont de Nemours, E. I., and Company. Barium- and ruthenium-containing perovskite catalysts. 4,200,554, Cl. 252-474.000.

Laurel Bank Machine Co., Ltd.: *See*—
Miyazaki, Yorizo; and Furuya, Katsuke, 4,199,911, Cl. 53-64.000.

Lauss, Hans-Dietrich: *See*—
Kyri, Hans; Lauss, Hans-Dietrich; and Schneider, Siegfried, 4,200,622, Cl. 423-471.000.

Laux, Friedrich-Gunther. Two-armed lever press. 4,199,973, Cl. 72-410.000.

Lawson, David E. Side view mirror assembly with butyl rubber adhesive. 4,200,359, Cl. 350-303.000.

Lebet, Jean-Philippe; and Droz, Jean-Claude, to Gillette Company, The. Alarm switch for an alarm circuit in a horological device. 4,199,930, Cl. 368-252.000.

Ledex, Inc.: *See*—
Roy, Kenneth L.; and Fugate, Philip E., 4,200,401, Cl. 400-124.000.

Lednicer, Daniel, to Upjohn Company, The. Polycycloanilines. 4,200,588, Cl. 260-571.000.

Lee, Yu-Sun; and Shackle, Dale R., to Mead Corporation, The. Process for producing a pressure-sensitive carbonless copy sheet using microcapsules formed in situ in a radiation curable binder. 4,200,667, Cl. 427-44.000.

Lefevre, Francois C. Grinding machine. 4,199,901, Cl. 51-83.0BS.

Le Francois, Philippe. Multicathode thermochemical processing oven. 4,200,805, Cl. 250-531.000.

Lehman H. Feeder & Plow, Inc.: *See*—
Calusio, Joseph C., 4,200,826, Cl. 318-484.000.

Lehman, Verne E. Controlled area boom sprayer. 4,199,896, Cl. 47-1.700.

Leifeld, Ferdinand; Beneke, Wolfgang; and Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Apparatus for producing a uniform continuous card sliver. 4,199,843, Cl. 19-240.000.

Leifels, Klaus-Dieter: *See*—
Tlach, Hugo; Leifels, Klaus-Dieter; and Mischler, Werner, 4,200,489, Cl. 162-162.000.

LEK, tovarna farmacevtskih in kemicnih izdelkov, n.sol.o.: *See*—
Jenko, Branko; Langof, Igor; and Habjan, Joza, 4,200,761, Cl. 548-342.000.

Leland, Wallace T.: *See*—
Stark, Eugene E., Jr.; Kephart, John F.; Leland, Wallace T.; and Reichelt, Walter H., 4,200,846, Cl. 331-94.50R.

Lemelson, Jerome H. Key assembly for electronic system. 4,200,227, Cl. 235-382.000.

Lenk, Erich: *See*—
Hartig, Wolfgang; and Lenk, Erich, 4,200,212, Cl. 226-24.000.

Levesque, Patrick: *See*—
Valdois, Michel; Levesque, Patrick; and Hartemann, Pierre, 4,199,990, Cl. 73-517.0AV.

Levi Strauss & Co.: *See*—
Blessing, Hubert, 4,200,049, Cl. 112-262.300.

Levin, Gilbert V., to Biospherics Incorporated. Bio-surface separation process. 4,200,524, Cl. 210-5.000.

Levine, Harris D. Anerobic adhesive package and method for the production thereof. 4,199,915, Cl. 53-401.000.

Levy, Donald J., to Lockheed Missiles & Space Co., Inc. Product recovery from alkali metal wastes. 4,200,617, Cl. 422-198.000.

Lewin, Brian M.: *See*—
Swaine, Derwent; Spong, Henry K.; and Lewin, Brian M., 4,200,610, Cl. 422-239.000.

Liaw, H. Ming; and Varker, Charles J., to Motorola, Inc. Sequential purification and crystal growth. 4,200,621, Cl. 423-348.000.

Libbey-Owens-Ford Company: *See*—
Albach, Eberhard R., 4,200,670, Cl. 427-154.000.

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Musmann, Hans-Georg; and Erdmann, Wolf-Dieter, 4,200,886, Cl. 358-135.000.

Lichliter, William L.; and Compton, Dennis N. Method of making a chimney sweeping brush. 4,200,339, Cl. 300-21.000.

Liebig, Lothar: *See*—
Wingler, Frank; Casper, Clemens; and Liebig, Lothar, 4,200,713, Cl. 526-64.000.

Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,200,221, Cl. 229-44.0CB.

Liesse, Maurice, to Agence Nationale de Valorisation de la Recherche (ANVAR). Percussion apparatus. 4,200,213, Cl. 227-10.000.

Lilly Company, The: *See*—
Steele, Wallace A., 4,200,673, Cl. 427-264.000.

Linde Aktiengesellschaft: *See*—
Hildebrandt, Peter, 4,200,138, Cl. 164-66.000.

Lindemann Maschinenfabrik GmbH: *See*—
Stodt, Eberhard, 4,200,422, Cl. 414-304.000.

Linder, Ernst: *See*—
Maurer, Helmut; Linder, Ernst; and Dillmann, Gerhard, 4,200,071, Cl. 123-124.00R.

Lindholm, Jan E. Transport container with a device for side tipping. 4,200,334, Cl. 298-7.000.

Lindkvist, Sven F.: *See*—
von Knorring, Folke; Lindkvist, Sven F.; and Valdemarsson, Lars S., 4,199,978, Cl. 73-133.00R.

Lingorski, Nikola A.: *See*—
Savov, Peter H.; Peev, Vassil G.; Valchev, Alexander Y.; and Lingorski, Nikola A., 4,200,452, Cl. 75-12.000.

Linhart, Friedrich; Stubenrauch, Gerd; and Hamprecht, Gerhard, to BASF Aktiengesellschaft. Preparation of 1-cyano-2,1,3-benzothiadiazinones. 4,200,743, Cl. 544-11.000.

Link, Otmar, to AZO-Maschinenfabrik Adolf Zimmermann GmbH. Apparatus for the dosaging of bulk material in a pneumatically conveyed stream. 4,200,414, Cl. 406-63.000.

Linnert, Peter J., to Trane Company, The. Hermetic compressor assembly including torque reaction leaf spring means. 4,200,426, Cl. 417-312.000.

Lion Hamigaki Kabushiki Kaisha: *See*—
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Liptay, John S.: *See*—
Hughes, Jeffrey F.; Liptay, John S.; Rymarczyk, James W.; and Stone, Stanley E., 4,200,927, Cl. 364-200.000.

Liss, Barry; and Welter, Charles R. Prevention of defluidization in the treatment of caking carbonaceous solids. 4,200,495, Cl. 201-9.000.

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Welter, Charles R.; Liss, Barry; Davis, Hubert G.; and Albright, Charles W., 4,200,494, Cl. 201-9.000.

Listle, Kenneth N.; and Shreeves, Ernest F., to Listle/Shreeves, Inc. Energy conserving construction. 4,200,034, Cl. 98-40.00C.

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Listle, Kenneth N.; and Shreeves, Ernest F., 4,200,034, Cl. 98-40.00C.

Liston, Thomas V.; and Lowe, Warren, to Chevron Research Company. Synergistic antioxidant lubricating oil additive composition. 4,200,543, Cl. 252-32.70E.

Litch, Ernest W., III, to General Electric Company. Torsional vibration isolating motor mounting system, mounting arrangement, assemblies including the same. 4,200,257, Cl. 248-604.000.
Lo, Grace Y-S.: *See—*
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,200,718, Cl. 526-173.000.
Lockheed Missiles & Space Co., Inc.: *See—*
Levy, Donald J., 4,200,617, Cl. 422-198.000.
Logan, Andrew H.; and Moore, Richard E., to Summa Corporation. Helicopter antitorque system using circulation control. 4,200,252, Cl. 244-17.190.
Logansport Distributors Inc.: *See—*
Welsh, Clarke T., 4,200,087, Cl. 126-299.00R.
Long, Everett J.; and Muench, Elmer W., to Everett/Charles, Inc. Straight through electrical spring probe. 4,200,351, Cl. 339-108.0TP.
Loof, Nils O. T. Marking sleeve for wires. 4,199,884, Cl. 40-316.000.
Lopez, Eugene F.: *See—*
Caponigro, Dennis A.; and Lopez, Eugene F., 4,200,676, Cl. 428-57.000.
L'Oreal: *See—*
Bauer, Daniel; Beck, Jean-Paul; and Braque, Gerard, 4,200,204, Cl. 222-133.000.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,200,432, Cl. 8-10.200.
Lovmark, August O. Paint pan. 4,199,836, Cl. 15-257.060.
Lowe, Warren: *See—*
Liston, Thomas V.; and Lowe, Warren, 4,200,543, Cl. 252-32.70E.
LTG Lufttechnische GmbH: *See—*
Honmann, Winfried; and Schaal, Gerd E., 4,200,441, Cl. 55-181.000.
Luber, Edward J., Jr.: *See—*
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,200,750, Cl. 544-346.000.
Lubrizol Corporation, The: *See—*
Clason, Donald L.; Pindar, John F.; and Cohen, Jerome M., 4,200,545, Cl. 252-33.400.
Forsberg, John W., 4,200,544, Cl. 252-33.200.
Lucas Industries Limited: *See—*
Bant, John A., 4,200,683, Cl. 429-48.000.
Ludwig Boschert GmbH & Co. KG: *See—*
Fazis, Harald, 4,200,019, Cl. 83-467.00R.
Ludwig, George C. Self adjusting shock absorber. 4,200,269, Cl. 267-65.00D.
Ludwig Taprogge Reinigungsanlagen fur Rohrenwarmeaustauscher: *See—*
Desai, Natvarlal B., 4,200,500, Cl. 203-7.000.
Lunde, Howard L. Ice cube making machine. 4,199,956, Cl. 62-138.000.
Lusi, Aino: *See—*
Fisher, Michael H.; Lusi, Aino; and Tolman, Richard L., 4,200,581, Cl. 424-180.000.
Luzhensky, Andrei B.: *See—*
Zakurdaev, Anatoly V.; and Luzhensky, Andrei B., 4,200,779, Cl. 200-187.000.
Lykes, Robert E.: *See—*
Buckman, John B.; and Lykes, Robert E., 4,199,861, Cl. 29-598.000.
Lynch, Thomas J.; and Rowatt, Robert J., to Gulf Oil Corporation. Vapor phase processes for the polymerization of olefins. 4,200,715, Cl. 526-88.000.
M&T Chemicals Inc.: *See—*
Treadwell, Kenneth, 4,200,699, Cl. 521-124.000.
Maahs, Gunther: *See—*
Diebel, Klaus; Wulf, Horst-Dieter; Grundmann, Raban; and Maahs, Gunther, 4,200,703, Cl. 525-357.000.
MacDonald, Robert D., III; and Nelson, Frederick W., to Minnesota Mining and Manufacturing Company. Stethoscope. 4,200,169, Cl. 181-131.000.
Machuron, Robert M. Apparatus for mincing and/or beating and/or mixing edible materials such as meat, fruit and vegetables. 4,200,240, Cl. 241-37.500.
MacRae, Brian P. Positioning, holding and lifting device. 4,200,040, Cl. 99-426.000.
Mader, Karl, to IDC Chemie AG. Method of after-foaming a mixture of a foam and a resin solution. 4,200,700, Cl. 521-186.000.
Madsen, Birger B., to Reofon A/S. Apparatus for generating electric shock pulses. 4,200.809, Cl. 307-132.00R.
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, to Metallgesellschaft AG; and St. Joe Minerals Corporation. Process for the volatilization of zinc and/or lead from metallurgical material. 4,200,454, Cl. 75-88.000.
Magami, Kozo: *See—*
Sato, Mikio; and Magami, Kozo, 4,200,857, Cl. 338-174.000.
Magerle, Karl. Process and apparatus for the production of a pipe-shaped hollow body, especially of container tubes from a multilayer composite sheet material. 4,200,482, Cl. 156-443.000.
Magnesium Elektron Inc.: *See—*
Sherif, Sherif A.; and Hachtmann, James E., 4,200,672, Cl. 427-226.000.
Magnussen, Ingar: *See—*
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.
Mahoney, John A.; and Frye, Clifton G., to Standard Oil Company (Indiana). Olefin purification process for hydrogen contaminated streams. 4,200,714, Cl. 526-68.000.
Maier, Elmar, to Hilti Aktiengesellschaft. Device for transporting fastening elements through a setting device. 4,200,216, Cl. 227-136.000.
Makabe, Hachiro; and Watanabe, Kazuo, to Janome Sewing Machine Co., Ltd. Electronic sewing machine. 4,200,048, Cl. 112-158.00E.
Makisumi, Yasuo; Murabayashi, Akira; and Sasatani, Takashi, to Shionogi & Co., Ltd. Process for the production of 3-aminoisoxazoles. 4,200,757, Cl. 548-246.000.
Malhaize, Emile: *See—*
Gillet, Auguste; Gilsoul, Paul; and Malhaize, Emile, 4,200,864, Cl. 340-507.000.
Malocha, Donald C., to University of Illinois Foundation. Tuned unidirectional surface wave transducer. 4,200,849, Cl. 333-194.000.
Malvano, Renato; Omini, Marco; and Carli, Natalino, to Fiat Societa per Azioni. Liquid crystal mirror for use as a rear-view mirror for vehicles. 4,200,361, Cl. 350-336.000.
Mangus, James D.: *See—*
Schrock, Steven L.; and Mangus, James D., 4,199,975, Cl. 73-40.700.
Manz, David F.: *See—*
Irwin, Clarence C.; and Manz, David F., 4,200,308, Cl. 280-804.000.
Mapal Fabrik fur Prazisionswerkzeuge KG: *See—*
Kress, Dieter; and Haberle, Friedrich, 4,200,418, Cl. 408-143.000.
Marchi, Egidio; and Montecchi, Lauretta, to Alfa Farmaceutici, S.p.A. Rifamycin derivatives and process for their preparation. 4,200,574, Cl. 260-239.30P.
Marchi, Egidio: *See—*
Brufani, Mario; Marchi, Egidio; Bellomo, Pierfranco; and Mascellani, Giuseppe, 4,200,573, Cl. 260-239.30P.
Marcy Gymnasium Equipment Company: *See—*
Goodwin, Max E., 4,200,280, Cl. 272-118.000.
Marder, Herman L.; Field, Nathan D.; and Shinohara, Makoto, to International Playtex, Inc. Preparation of water-insoluble carboxymethyl cellulose absorbents. 4,200,737, Cl. 536-87.000.
Mardirossian, John H., to Textron, Inc. Band making apparatus. 4,199,968, Cl. 72-49.000.
Margetts, Hugh G., to Girling Limited. Control valve assemblies for hydraulic braking systems. 4,200,340, Cl. 303-6.00A.
Marjollet, Jacques; Tondeur, Gerard; Cerdan, Jean-Pierre; and Talleu, Patrick, to Stein Industrie. Vertical separator for separating a mixture of fluid phases. 4,200,443, Cl. 55-347.000.
Marquip, Inc.: *See—*
Marschke, Carl R., 4,200,276, Cl. 271-279.000.
Marsai, Maria: *See—*
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.
Marschke, Carl R., to Marquip, Inc. Shingling and stacking of conveyed sheet material. 4,200,276, Cl. 271-279.000.
Martin, John K., to Investigacion FIC Fideicomiso. Apparatus for blow molding hollow glassware. 4,200,449, Cl. 65-229.000.
Martin, Niles J.: *See—*
Bains, Gurdip S.; Martin, Niles J.; and Jackson, Leigh F., 4,199,907, Cl. 52-125.000.
Martin, William J.: *See—*
Lamoureux, William R.; Martin, William J.; and Trushell, James B., 4,200,868, Cl. 340-713.000.
Martinec, Eugene F., to Health-Mor, Inc. Suction cleaner power nozzle construction. 4,199,839, Cl. 15-354.000.
Marvin Glass & Associates: *See—*
Meyer, Burton C.; and Gardner, Denise, 4,200,197, Cl. 220-263.000.
Mascellani, Giuseppe: *See—*
Brufani, Mario; Marchi, Egidio; Bellomo, Pierfranco; and Mascellani, Giuseppe, 4,200,573, Cl. 260-239.30P.
Maschinenbau Oppenweiler GmbH: *See—*
Klenk, Emil; and Hornung, Adolf, 4,200,277, Cl. 271-90.000.
Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Buddenhagen, Uwe, 4,200,065, Cl. 123-41.540.
Urlaub, Alfred; and Muller, Eckart, 4,200,237, Cl. 239-533.120.
Maschinenfabrik Hennecke GmbH: *See—*
Raffel, Reiner; Hauptmann, Gunter; Reffelmann, Gerd; and Ebeling, Wilfried, 4,200,603, Cl. 264-51.000.
Massachusetts Institute of Technology: *See—*
Bekefi, George; and Orzechowski, Thaddeus J., 4,200,821, Cl. 315-39.510.
Buckley, Bruce S., 4,200,921, Cl. 367-87.000.
Smith, Henry I.; Austin, Stewart S.; and Flanders, Dale C., 4,200,395, Cl. 356-356.000.
Massaro, Anthony A., Jr.: *See—*
Meuschke, Robert E.; Andrews, Harry N.; and Massaro, Anthony A., Jr., 4,200,172, Cl. 182-46.000.
Massey, Fred L.; and Sponseller, Trent A., to Goodyear Tire & Rubber Company, The. Endcapped polyesters. 4,200,731, Cl. 525-437.000.
Masuda, Ikuro: *See—*
Ueno, Masahiro; and Masuda, Ikuro, 4,200,225, Cl. 371-27.000.
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, to Daiken Kogyo Co., Ltd.; Daikin Plant Co., Ltd.; and Ijichi Shukeijo Co., Ltd., part interest to each. Chilling apparatus for broiler carcasses. 4,199,958, Cl. 62-374.000.
Masukawa, Toyoaki: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,200,466, Cl. 430-566.000.
Masumura, Masao, to Ricoh Company, Ltd. Image reversal electrostatographic apparatus. 4,200,387, Cl. 355-3.0DD.
Masyc A.G.: *See—*
Gunti, Rolf, 4,200,178, Cl. 198-372.000.

Mathews, Ronald D.: *See—*
Rawlings, Robert L.; and Mathews, Ronald D., 4,200,930, Cl. 364-200.000.

Mathues, Thomas P.; and Parker, Donald L., to General Motors Corporation. Dual power brake booster and method of generating brake actuating pressure. 4,199,940, Cl. 60-547.00R.

Mathues, Thomas P.; and Parker, Donald L., to General Motors Corporation. Dual power brake booster system. 4,199,947, Cl. 60-547.00R.

Mathues, Thomas P.; and Parker, Donald L., to General Motors Corporation. Dual power brake booster. 4,199,948, Cl. 60-553.000.

Matison, Gary G., to Dictaphone Corporation. Instruction indicating apparatus for a record and/or playback device. 4,200,893, Cl. 360-72.100.

Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 2-Amino-cyclopent-1-ene-1-thiocarboxylic acid-disulfides to treat noradrenergic malfunctions. 4,200,650, Cl. 424-319.000.

Matsui, Toshio; Doi, Yasuhiko; and Nakamura, Yasuo, to Minolta Camera Kabushiki Kaisha. Pressure fixing apparatus for copier. 4,200,389, Cl. 355-3.0FU.

Matsumoto, Kuniaki, to Hitachi, Ltd. Control of the flow rate and fluid pressure in a pipeline network for optimum distribution of the fluid to consumers. 4,200,911, Cl. 364-105.000.

Matsumura, Susumu: *See—*
Sato, Yasuhisa; Tsuji, Sadahiko; Ishikawa, Kazuo; and Matsumura, Susumu, 4,200,380, Cl. 354-219.000.

Matsunaga, Isao: *See—*
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Matsuo, Hideaki, to Yoshida Kogyo K.K. End stopper for concealed fastener. 4,199,846, Cl. 24-205.11R.

Matsuo, Noboru: *See—*
Tanaka, Shikei; Kobayashi, Tetsuji; Matsuo, Noboru; and Takahashi, Haruo, 4,200,814, Cl. 307-309.000.

Matsuo, Syunji: *See—*
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Masukawa, Toyoaki; and Kaneko, Yutaka, 4,200,466, Cl. 430-566.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Sekiwa, Mitsunao, 4,200,018, Cl. 83-425.000.
Takeda, Kenji, 4,200,294, Cl. 274-10.00R.

Matta, Joseph E.; and Kissell, Fred N., to United States of America, Interior. Ventilation system for automated mining machines. 4,200,036, Cl. 98-50.000.

Matter, Robert C.; and Bish, James R., to General Motors Corporation. Continuous horizontal caster. 4,200,143, Cl. 164-440.000.

Matuda, Yukimasa: *See—*
Abe, Toshizo; Goko, Nobuaki; Nishihara, Yasuhiro; and Matuda, Yukimasa, 4,200,717, Cl. 526-159.000.

Mauck, James W.: *See—*
Colburn, Samuel E.; and Mauck, James W., 4,200,614, Cl. 422-134.000.

Maurer, Fritz; Schroder, Rolf; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Combating arthropods with N,N-dialkyl-O-(2-substituted-methyl-pyrimidin-4-yl)-carbamic acid esters. 4,200,637, Cl. 424-251.000.

Maurer, Helmut; Linder, Ernst; and Dillmann, Gerhard, to Robert Bosch GmbH. Exhaust gas control system for an internal combustion engine. 4,200,071, Cl. 123-124.00R.

Mazzer, Giacomo: *See—*
Bottini, Emilio; and Mazzer, Giacomo, 4,200,677, Cl. 428-246.000.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Process of preparing finely divided polyolefin resins. 4,200,601, Cl. 264-9.000.

McClain, Dorothee M., to National Distillers and Chemical Corporation. Process for sequentially dispersing and saponifying ethylene-vinyl acetate copolymer. 4,200,708, Cl. 525-62.000.

McClellan, Alan J., to General Motors Corporation. Plastic dust tube for shock absorber and method of manufacture. 4,199,855, Cl. 29-450.000.

McConnell, W. C.: *See—*
Fraley, Jack E.; Sommers, Earl F.; Strang, Shorter; and McConnell, W. C., 4,200,232, Cl. 239-112.000.

McCreary, James L.: *See—*
Hodges, David A.; Gray, Paul R.; and McCreary, James L., 4,200,863, Cl. 340-347.0AD.

McDonnell Douglas Corporation: *See—*
Byrd, Norman R., 4,200,609, Cl. 422-122.000.

McGeorge, Gram, to Robertshaw Controls Company. Circuit board arrangement. 4,200,900, Cl. 361-412.000.

McGill, Manley, to American National Red Cross. Method of storing physiological material. 4,199,954, Cl. 62-62.000.

McHugh, Carl M.: *See—*
Hood, Clarence E.; McHugh, Carl M.; and Hawkins, Fletcher G., 4,199,913, Cl. 53-244.000.

McLees, Alan L.: *See—*
Herr, Charles H., Jr.; and McLees, Alan L., 4,199,979, Cl. 73-134.000.

McMorrow, Richard H., Jr., to Hewlett-Packard Company. Coupling circuit with driven guard. 4,200,109. Cl. 128-696.000.

McPhee, Donald J.: *See—*
Hush, James M.; and McPhee, Donald J., 4,200,125, Cl. 138-126.000.

McWhorter, Daniel M., to Kendall Company, The. Device for measuring the force of a urine discharge. 4,200,112, Cl. 128-761.000.

Mead Corporation, The: *See—*
Lee, Yu-Sun; and Shackle, Dale R., 4,200,667, Cl. 427-44.000.

Mechalas, Emmanuel. Rotary filter. 4,200,530, Cl. 210-77.000.

Medi-Ray, Inc.: *See—*
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, 4,200,804, Cl. 250-506.000.

Meijs, Franciscus H., to Shell Oil Company. Method for automatically lubricating pipe joint. 4,199,858, Cl. 29-458.000.

Meinert, Norbert: *See—*
Broemer, Heinz; Huber, Werner; and Meinert, Norbert, 4,200,467, Cl. 106-47.00Q.

Mendenhall, Charles E.; and Sandusky, Randall L., to Sperry Rand Corporation. Phase comparator with dual phase detectors. 4,200,845, Cl. 331-1.00A.

Merck & Co., Inc.: *See—*
Fisher, Michael H.; Lusi, Aino; and Tolman, Richard L., 4,200,581, Cl. 424-180.000.

Merkle, Josef, to Daimler-Benz Aktiengesellschaft. Pneumatic spring, especially for vehicles. 4,200,270, Cl. 267-65.00B.

Merkle, Ralph C.: *See—*
Hellman, Martin E.; Diffie, Bailey W.; and Merkle, Ralph C., 4,200,770, Cl. 178-22.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Hofmann, Otto, 4,200,934, Cl. 364-571.000.

Metallgesellschaft AG: *See—*
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.

Metallwerk Max Brose GmbH & Co.: *See—*
Muhling, Gunter; and Hess, Hans-Peter, 4,199,899, Cl. 49-352.000.

Mettler Instrument AG: *See—*
Baumann, Arthur, 4,200,896, Cl. 364-570.000.

Metz, Joseph R., to Norco, Inc. Ball-type mechanical transmission. 4,199,999, Cl. 74-424.8NA.

Metzger, Karl G.: *See—*
Feyen, Peter; Preiss, Michael; and Metzger, Karl G., 4,200,576, Cl. 424-246.000.

Meuschke, Robert E.; and Beer, Robert W., to Westinghouse Electric Corp. Tube bundle removal method and apparatus. 4,199,857, Cl. 29-157.400.

Meuschke, Robert E.; Andrews, Harry N.; and Massaro, Anthony A., Jr., to Westinghouse Electric Corp. Radiation shielded movable work station apparatus. 4,200,172, Cl. 182-46.000.

Meyer, Burton C.; and Gardner, Denise, to Marvin Glass & Associates. Animated toy box. 4,200,197, Cl. 220-263.000.

Meyer, Franz-Josef, to Daimler-Benz Aktiengeseilschaft. Combustion chamber, especially for gas turbines. 4,199,934, Cl. 60-39.230.

Meyer, Lawrence L.; Mueller, Robert S.; and Walsh, Michael M., to Eaton Corporation. Valve selector. 4,200,081, Cl. 123-198.00F.

Meyer, Lawrence L., to Eaton Corporation. Valve selector. 4,200,082, Cl. 123-198.00F.

Meyer, Walter C.: *See—*
FitzGerald, Emerson B.; and Meyer, Walter C., 4,200,566, Cl. 260-37.00N.

Micafil, AG: *See—*
Striffeler, Werner, 4,200,698, Cl. 521-120.000.

Michaelis, Walfried: *See—*
Fanger, Hans-Ulrich; Pepelnik, Rudolf; and Michaelis, Walfried, 4,200,792, Cl. 250-359.000.

Michaels, Raymond J.: *See—*
Stein, Robert G.; Couch, Terry L.; and Michaels, Raymond J., 4,200,654, Cl. 424-330.000.

Microwave Semiconductor Corp.: *See—*
Frey, Richard H., 4,200,880, Cl. 357-51.000.

Miles Laboratories, Inc.: *See—*
Johnson, Leighton C., 4,200,056, Cl. 118-401.000.

Miller, Clarence L., Jr.: *See—*
Datta, Amitava; Miller, Clarence L., Jr.; and Shilling, Jack W., 4,200,477. Cl. 148-113.000.

Miller, David H.: *See—*
Evans, Marvin; and Miller, David H., 4,200,262, Cl. 266-44.000.

Miller, Donald L., to Facet Enterprises, Inc. Magnetic viscous damper. 4,200,003, Cl. 74-574.000.

Miller, John W. V., to Owens-Illinois, Inc. MOS Circuit for generating a square wave form. 4,200,822, Cl. 315-169.400.

Miller, Norman K. Pressure switch. 4,200,777, Cl. 200-85.00A.

Millipore Corporation: *See—*
Reti, Adrian R., 4,200,095, Cl. 128-214.00C.
Root, David M.; and Cole, Francis X., 4,200,690, Cl. 435-7.000.

Milum, Jimmy L., to Emerson Electric Co. High voltage power supply for electrostatic air cleaner. 4,200,909, Cl. 363-144.000.

Mina, Ramses R.: *See—*
Kraushaar, Jonathan M.; and Mina, Ramses R., 4,200,771, Cl. 179-8.00A.

Minigrip, Inc.: *See—*
Ausnit, Steven, 4,199,845, Cl. 24-201.00C.

Minnesota Mining and Manufacturing Company: *See—*
Beck, Edward D., 4,200,547, Cl. 252-62.540.
Flor, Lawrence A.; and Kurttila, Kenneth R., 4,200,675, Cl. 428-43.000.
Heyer, Raymond F.; and Klecker, Gary J., 4,199,835, Cl. 15-209.00B.
MacDonald, Robert D., III; and Nelson, Frederick W., 4,200,169, Cl. 181-131.000.

Minolta Camera Kabushiki Kaisha: *See—*
Matsui, Toshio; Doi, Yasuhiko; and Nakamura, Yasuo, 4,200,389, Cl. 355-3.0FU.

Mioduski, Paul: *See—*
Bauers, William R.; Mioduski, Paul; and Ceccon, Claude R., 4,199,987, Cl. 73-379.000.

Mischler, Werner: *See—*
Tlach, Hugo; Leifels, Klaus-Dieter; and Mischler, Werner, 4,200,489, Cl. 162-162.000.

Miskin, David M. Thermostat control solenoid for lawn watering. 4,200,122, Cl. 137-624.130.

Mitchell, Richard P., to American Can Company. Applying a stretch film lid to a cup. 4,199,917, Cl. 53-441.000.

Mitchell, Ronald G. Windshield cleaning system. 4,200,233, Cl. 239-280.000.

Mitsubishi Chemical Industries, Ltd.: *See—*
Abe, Toshizo; Goko, Nobuaki; Nishihara, Yasuhiro; and Matuda, Yukimasa, 4,200,717, Cl. 526-159.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Ikemi, Shinichi; and Ohba, Koichi, 4,199,967, Cl. 72-12.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Watanabe, Shigeru; Ishida, Michiyasu; and Iwasaki, Hideo, 4,199,829, Cl. 5-81.00R.

Mitsuguchi, Yukio: *See—*
Momoi, Shoji; and Mitsuguchi, Yukio, 4,200,013, Cl. 82-2.500.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Kasahara, Nobuyoshi; and Nonumura, Koutaro, 4,200,475, Cl. 148-6.100.

Miyazaki, Yorizo; and Furuya, Katusuke, to Laurel Bank Machine Co., Ltd. Coin packaging machine. 4,199,911, Cl. 53-64.000.

Mobil Oil Corporation: *See—*
Fitch, John L., 4,200,413, Cl. 406-49.000.
Horodysky, Andrew G., 4,200,546, Cl. 252-46.400.
Sedlak, Michael, 4,200,542, Cl. 252-25.000.

Mochida, Ei; Ogawa, Nobuhisa; Shinkai, Hiroyuki; and Hashimoto, Masakatsu, to Mochida Seiyaku Kabushiki Kaisha. Immunochemical measuring process. 4,200,436, Cl. 23-230.00B.

Mochida Seiyaku Kabushiki Kaisha: *See—*
Mochida, Ei; Ogawa, Nobuhisa; Shinkai, Hiroyuki; and Hashimoto, Masakatsu, 4,200,436, Cl. 23-230.00B.

Mochizuki, Seiji: *See—*
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, 4,200,632, Cl. 424-230.000.

Modern Suspension Systems, Inc.: *See—*
Hager, Clarence H., 4,200,195, Cl. 211-24.000.

Moen, Olav O.: *See—*
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.

Moench, Jerry D., to Motorola, Inc. Quiet column decoder. 4,200,917, Cl. 365-208.000.

Mohr, Siegfried H. Pedal having an improved foot-retaining strap means. 4,200,005, Cl. 74-594.600.

Molins Limited: *See—*
Clarke, Peter A., 4,200,181, Cl. 198-572.000.

Moll, Werner O.: *See—*
Panek, Edward J.; Moll, Werner O.; Bergman, Lee H.; and Kersten, Siegfried P., 4,200,501, Cl. 203-7.000.

Momoi, Shoji; and Mitsuguchi, Yukio, to Kabushiki Kaisha Yamazaki Tekkosho. Automatic supply device for bar stocks for lathe. 4,200,013, Cl. 82-2.500.

Monnier, Dan E., to Norlin Industries, Inc. Switchable divider. 4,200,842, Cl. 328-42.000.

Monschke, Charles P., to Victor Equipment Company. Multiple piece torch tip. 4,200,235, Cl. 239-424.500.

Montecchi, Lauretta: *See—*
Marchi, Egidio; and Montecchi, Lauretta, 4,200,574, Cl. 260-239.30P.

Montedison S.p.A.: *See—*
Biglione, Gianfranco; Bertazzoni, Guido; and Alvares, Antonio, 4,200,696, Cl. 521-58.000.

Moog, William C. Apparatus for roll-stabilizing a vehicle. 4,200,168, Cl. 180-282.000.

Mookherjee, Braja D.: *See—*
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,741, Cl. 544-5.000.
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,742, Cl. 544-5.000.

Moore, Edwin G.: *See—*
Stroupe, Stephen D.; and Moore, Edwin G., 4,200,435, Cl. 23-230.00B.

Moore, Garry L.: *See—*
Keyes, Melvin H.; and Moore, Garry L., 4,200,238, Cl. 241-21.000.

Moore, James D.: *See—*
Ryan, John W.; and Moore, James D., 4,200,287, Cl. 273-86.00B.

Moore, Richard E.: *See—*
Logan, Andrew H.; and Moore, Richard E., 4,200,252, Cl. 244-17.190.

Moore, William C.: *See—*
Shelby, Billy L.; and Moore, William C., 4,200,905, Cl. 362-396.000.

Moreau, Jean-Pierre, to Baroclem S. A. Method of and machine for manufacturing support grids for storage battery electrode plates. 4,199,849, Cl. 29-2.000.

Morel, Paul; and Dugois, Jean-Pierre, to Aluminum Pechiney. Device for reducing magnetic disturbances in series of very high intensity electrolysis cells. 4,200,513, Cl. 204-243.00M.

Morgan, Homer R. Tailgate construction. 4,200,328, Cl. 296-50.000.

Mori, Takashi: *See—*
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Morioka, Takayuki; and Ide, Jushi, to Hitachi, Ltd. Printed circuit board capable of being inserted and withdrawn on on-line status. 4,200,865, Cl. 340-536.000.

Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, to Tokyo Shibaura Electric Co., Ltd. Precise feeding table apparatus. 4,199,996, Cl. 74-89.150.

Morling, Richard C. S.: *See—*
Cain, Gerald D.; Dilley, James E.; and Morling, Richard C. S., 4,200,810, Cl. 307-221.00D.

Morris, Henry B., to Texas Instruments Incorporated. Method of depositing titanium dioxide (rutile) as a gate dielectric for MIS device fabrication. 4,200,474, Cl. 148-1.500.

Morton-Norwich Products, Inc.: *See—*
Wright, George C.; and White, Ronald E., 4,200,756, Cl. 546-297.000.

Moscatelli, Silvano, to I.B.P. Industrie Buitoni Perugina S.p.A. Apparatus for producing nearly parallelepipedal packaging containers. 4,199,919, Cl. 53-552.000.

Moscovsky Inzhenerno-Fizichesky Institut: *See—*
Zakurdaev, Anatoly V.; and Luzhensky, Andrei B., 4,200,779, Cl. 200-187.000.

Moskovsky Institut Neftekhimicheskoi I Gazovoi Promyshlennosti Imeni I.M. Gubkina: *See—*
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Moskowitz, Ronald: *See—*
Stahl, Philip; Moskowitz, Ronald; and Reed, Walter R., 4,200,296, Cl. 277-80.000.

Mosser Industries, Inc.: *See—*
Connor, Peter J., 4,199,898, Cl. 49-92.000.

Motegi, Akira: *See—*
Tagashira, Satoshi; Motegi, Akira; and Ishiguro, Toshio, 4,200,390, Cl. 355-14.00R.

Motoren- und Turbinen-Union Munchen GmbH: *See—*
Das Gupta, Arun-Kumar; and Seidl, Franz, 4,200,273, Cl. 269-61.000.

Motorola, Inc.: *See—*
Flowers, Dervin L., 4,200,463, Cl. 430-317.000.
Harrington, Wayne D.; and Musa, Fuad H., 4,200,912, Cl. 364-200.000.
Liaw, H. Ming; and Varker, Charles J., 4,200,621, Cl. 423-348.000.
Moench, Jerry D., 4,200,917, Cl. 365-208.000.

Mougin, Georges L., to ITI Limited. Protective side wall for tabular icebergs. 4,200,409, Cl. 405-52.000.

Moynihan, Daniel J.; and Campbell, John A. L., to Peabody Coal Company. Gauging apparatus and method, particularly for controlling mining by a mining machine. 4,200,335, Cl. 299-1.000.

Muchow, John D.; Jones, Graham J.; and Slegers, Maurice, to Willis Oil Tool Co. Pig ball transfer unit. 4,199,834, Cl. 15-104.06A.

Muehlenbrock, Dale R.; Prihoda, John R.; and Singleton, Leonard, Jr., to Diamond Shamrock Corporation. Process for polymerization of polyvinyl chloride and VCM monomer removal. 4,200,734, Cl. 528-503.000.

Mueller, Jiri: *See—*
Vagac, Svetozar; Prochazka, Bretislav; Mueller, Jiri; Kostka, Anton; and Carsky, Milan, 4,200,486, Cl. 162-8.000.

Mueller, Robert S.: *See—*
Meyer, Lawrence L.; Mueller, Robert S.; and Walsh, Michael M., 4,200,081, Cl. 123-198.00F.

Muench, Elmer W.: *See—*
Long, Everett J.; and Muench, Elmer W., 4,200,351, Cl. 339-108.0TP.

Muhling, Gunter; and Hess, Hans-Peter, to Metallwerk Max Brose GmbH & Co. Window lifting mechanism. 4,199,899, Cl. 49-352.000.

Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., to Compagnie Francaise de Raffinage. Process for the preparation of a hydrogen reserve. 4,200,623, Cl. 423-644.000.

Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., to Compagnie Francaise de Raffinage. Combined hydrogen storage and production process. 4,200,624, Cl. 423-644.000.

Muller, Eckart: *See—*
Urlaub, Alfred; and Muller, Eckart, 4,200,237, Cl. 239-533.120.

Muller, Sylvio. Mattress securing apparatus. 4,199,831, Cl. 5-411.000.

Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., to Excel Industries, Inc. Lawn edger attachment. 4,200,155, Cl. 172-14.000.

Mulvany, Paul K., to Chevron Research Company. Heat exchanger anti-foulant. 4,200,518, Cl. 208-48.0AA.

Munz, Wolf-Dieter; Bock, Siegfried; and Potzlberger, Hans W., to Siemens Aktiengesellschaft. Method for producing an electrical thin layer circuit. 4,200,502, Cl. 204-15.000.

Murabayashi, Akira: *See—*
Makisumi, Yasuo; Murabayashi, Akira; and Sasatani, Takashi, 4,200,757, Cl. 548-246.000.

Murakami, Fumio; Enya, Takeshi; and Ochiai, Yoshinori, to Hitachi Medical Corporation. Storage cell type X-ray apparatus. 4,200,796, Cl. 250-402.000.

Murakami, Saburo, to Wataru Shimokawa. Reciprocating motion generating apparatus. 4,199,995, Cl. 74-54.000.

Muramatsu, Sachio: *See—*
Yamagishi, Kiichiro; Hirose, Matutaro; and Muramatsu, Sachio, 4,200,211, Cl. 226-21.000.
Murase, Ichiki: *See—*
Sano, Takezo; and Murase, Ichiki, 4,200,735, Cl. 536-30.000.
Murata Manufacturing Co., Ltd.: *See—*
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,200,847, Cl. 333-125.000.
Murayama, Norio; Hayashi, Yukitaka; Hamada, Nagaharu; and Hara, Toshitaka, to Hitachi, Ltd. Data display control system with plural refresh memories. 4,200,869, Cl. 340-723.000.
Murfree, James A.: *See—*
Croomes, Edgar F.; and Murfree, James A., 4,200,608, Cl. 422-97.000.
Musa, Fuad H.: *See—*
Harrington, Wayne D.; and Musa, Fuad H., 4,200,912, Cl. 364-200.000.
Musmann, Hans-Georg; and Erdmann, Wolf-Dieter, to Licentia Patent-Verwaltungs-G.m.b.H. Method for transmitting video signals with the aid of DPC modulation and controlled quantizer. 4,200,886, Cl. 358-135.000.
Mutzhas, Maxim F. Filter for protection against radiation, especially with regard to direct pigmentation by solar radiation. 4,200,360, Cl. 350-316.000.
Myles, J. Edgar, to J. E. Myles, Inc. Pressure indicator. 4,199,992, Cl. 73-744.000.
Myreen, Bertel, to RA-Shipping Ltd. OY. Apparatus for heating a liquid suspension by another liquid suspension. 4,200,600, Cl. 261-147.000.
N L Industries, Inc.: *See—*
Naughton, Francis C., 4,200,565, Cl. 260-31.600.
N-S-W Corporation: *See—*
Wilmeth, Claude H., 4,200,011, Cl. 81-57.390.
Naarmann, Herbert: *See—*
Gausepohl, Hermann; Naarmann, Herbert; Penzien, Klaus; and Stephan, Rudolf, 4,200,702, Cl. 525-72.000.
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Nitric ester of N-(2-hydroxyethyl)nicotinamide and pharmaceutical use. 4,200,640, Cl. 424-266.000.
Nagasawa, Yasuo; and Yamada, Junichi, to Hitachi Medical Corporation. Device for setting region of interest for scintillation camera. 4,200,793, Cl. 250-363.00S.
Nagata, Katsuyuki: *See—*
Hirono, Hatsuo; Nagata, Katsuyuki; and Doguchi, Nobushige, 4,200,503, Cl. 204-38.00A.
Nagata, Yoshinosuke; Kutsuyama, Hiroshi; Yamada, Makoto; and Tsukamoto, Kazuyoshi, to Sanyo Electric Co., Ltd. Preset tuning apparatus using floating gate type field effect device. 4,200,841, Cl. 455-169.000.
Nagumo, Fumio, to Sony Corporation. Signal processing system for a solid state television camera. 4,200,884, Cl. 358-11.000.
Nagumo, Fumio: *See—*
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,200,883, Cl. 358-44.000.
Naito, Junichiro: *See—*
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,199,938, Cl. 60-274.000.
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, to Nippon Kayaku Kabushiki Kaisha. 2-Hydroxy benzamide derivatives and use thereof as fungicides. 4,200,632, Cl. 424-230.000.
Nakahara, Akihiko: *See—*
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,200,711, Cl. 525-387.000.
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, to Kyodo Insatsu Kabushiki Kaisha; and Lion Hamigaki Kabushiki Kaisha. Collapsible tube and method of manufacture. 4,200,051, Cl. 113-120.00D.
Nakamura, Junichi. Anti-fungal substance and preparing method thereof. 4,200,629, Cl. 424-195.000.
Nakamura, Yasuo: *See—*
Matsui, Toshio; Doi, Yasuhiko; and Nakamura, Yasuo, 4,200,389, Cl. 355-3.0FU.
Nakamura, Yoshiaki; and Abe, Takaharu, to Nippon Electric Company, Ltd. Container for storage or transportation of semiconductor chips. 4,200,191, Cl. 206-328.000.
Nakamura, Zenzo: *See—*
Aizawa, Hiroshi; Uchidoi, Masanori; Nakamura, Zenzo; and Takishima, Yoshiyuki, 4,200,370, Cl. 354-33.000.
Nakamuru, Yasuo: *See—*
Okamura, Kenichiro; and Nakamuru, Yasuo, 4,200,549, Cl. 252-182.000.
Nakanishi, Kenichi: *See—*
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.
Nakanishi, Michio: *See—*
Kubo, Masyoshi; Nakanishi, Michio; and Watanabe, Shoji, 4,200,560, Cl. 260-22.0EP.
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, to Nippon Soken, Inc. Method of operating a three-way catalyst for internal combustion engines. 4,199,938, Cl. 60-274.000.
Nakazeki, Tsugito: *See—*
Kimata, Kei; and Nakazeki, Tsugito, 4,200,120, Cl. 137-613.000.
Napel, Larry P.: *See—*
Koliba, Melvin J.; and Napel, Larry P., 4,200,046, Cl. 410-94.000.
National Distillers and Chemical Corporation: *See—*
Colburn, Samuel E.; and Mauck, James W., 4,200,614, Cl. 422-134.000.
Goetz, Richard W., 4,200,765, Cl. 568-862.000.
Hoyt, John M., 4,200,709, Cl. 525-62.000.
McClain, Dorothee M., 4,200,601, Cl. 264-9.000.
McClain, Dorothee M., 4,200,708, Cl. 525-62.000.
National Research Development Corporation: *See—*
Cain, Gerald D.; Dilley, James E.; and Morling, Richard C. S., 4,200,810, Cl. 307-221.00D.
Kinner, George H.; and Lancaster, John K., 4,200,541, Cl. 252-12.200.
Wetton, Raymond E.; and James, David B., 4,200,701, Cl. 525-4.000.
Naughton, Francis C., to N L Industries, Inc. Coupling agents for thermoset resin composites. 4,200,565, Cl. 260-31.600.
Necchi Societa per Azioni: *See—*
Bianchi, Nereo, 4,200,050, Cl. 112-292.000.
Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek: *See—*
Ritter, Fridolin J., 4,200,590, Cl. 260-601.00R.
Neely, James W.: *See—*
Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., 4,200,695, Cl. 521-28.000.
Neidigh, Robert J.; and Van Fossen, Harvey G., to Wheelabrator-Frye Inc. Blast head rigging apparatus for tank side cleaning. 4,199,905, Cl. 51-429.000.
Nelms, David E. Key-operated electrical switch assembly. 4,200,774, Cl. 200-44.000.
Nelson, Carl J.: *See—*
Chalmers, Franklin S.; Czako, Charles A.; and Nelson, Carl J., 4,200,517, Cl. 208-11.00R.
Nelson, Frederick W.: *See—*
MacDonald, Robert D., III; and Nelson, Frederick W., 4,200,169, Cl. 181-131.000.
Nelson, George. Panel base. 4,200,254, Cl. 248-188.800.
Neuendorf, Manfred; Schmitt, Ernst; and Schubert, Gustav, to Siemens Aktiengesellschaft. Dental x-ray diagnostic apparatus. 4,200,798, Cl. 250-439.00P.
Newberry, Sterling P.; and Burgess, John R., to Control Data Corporation. Micro lens array and micro deflector assembly for fly's eye electron beam tubes using silicon components and techniques of fabrication and assembly. 4,200,794, Cl. 250-396.0ML.
Newcomb, Alan L., to Smith International, Inc. Sweep pickup for a big hole bit. 4,200,160, Cl. 175-340.000.
NGK Insulators, Ltd.: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, 4,200,552, Cl. 252-466.0PT.
Nichols, George F.: *See—*
O'Connell, Lawrence E.; and Nichols, George F., 4,200,510, Cl. 204-192.00R.
Nicholson, Norman E.: *See—*
Bailey, Edgar E.; Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,200,619, Cl. 423-242.000.
Nickel, Walter; and Tarczy-Hornoch, Zoltan, to Systron-Donner Corporation. Method of automatically calibrating a microprocessor controlled digital multimeter. 4,200,933, Cl. 364-571.000.
Niederer, Peter G., to Sulzer Brothers Limited. Intramedullary stem. 4,199,824, Cl. 3-1.913.
Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., to U.S. Philips Corporation. Deflection unit for an in-line color cathode-ray tube. 4,200,851, Cl. 335-210.000.
Nife Jungner AB: *See—*
Frode, Per E. L.; and Olsson, Karl B. R., 4,200,687, Cl. 429-130.000.
Nigg, Fritz: *See—*
Schneider, Bruno; Nigg, Fritz; and Risse, Jean-Claude, 4,200,246, Cl. 242-67.400.
Nippon Electric Company, Ltd.: *See—*
Inaba, Masao; and Kashigi, Kazuo, 4,200,890, Cl. 358-183.000.
Nakamura, Yoshiaki; and Abe, Takaharu, 4,200,191, Cl. 206-328.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Chibana, Masanobu, 4,200,021, Cl. 84-1.220.
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,200,879, Cl. 357-43.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, 4,200,632. Cl. 424-230.000.
Nippon Kogaku K.K.: *See—*
Ishizaka, Sunao; and Araki, Yoshitaka, 4,200,381, Cl. 354-289.000.
Nippon Soken, Inc.: *See—*
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,200,843, Cl. 328-142.000.
Kosuda, Tooru; Ohashi, Michihiro; and Katou, Hiromi, 4,200,074, Cl. 123-139.0BG.
Nakase, Takamichi; Hattori, Tadashi; Naito, Junichiro; and Kondo, Kenji, 4,199,938, Cl. 60-274.000.
Nishihara, Yasuhiro: *See—*
Abe, Toshizo; Goko, Nobuaki; Nishihara, Yasuhiro; and Matuda, Yukimasa, 4,200,717, Cl. 526-159.000.
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, to Murata Manufacturing Co., Ltd. Rectangular branching filter

having plurality of rod members for fine impedance matching. 4,200,847, Cl. 333-125.000.
Nishimura, Tatsuo: *See*—
Numata, Mitsuo; and Nishimura, Tatsuo, 4,200,575, Cl. 424-246.000.
Nishimura, Toshimichi: *See*—
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,200,883, Cl. 358-44.000.
Nishioka, Yoshihiro: *See*—
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, 4,199,958, Cl. 62-374.000.
Nissan Motor Company, Limited: *See*—
Takahashi, Kotei, 4,200,002, Cl. 74-530.000.
Noack, Christian: *See*—
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, to Toyota Jidosha Kogyo Kabushiki Kaisha; and NGK Insulators, Ltd. Catalyst carrier, catalyst and their manufacturing process. 4,200,552, Cl. 252-466.0PT.
Noji, Masahide: *See*—
Kidani, Yoshinori; and Noji, Masahide, 4,200,583, Cl. 260-345.70R.
Nomura, Harehiko; Koyama, Kenichi; and Terao, Kazuhiko, to Agency of Industrial Science & Technology. Superconductor covered with reinforced aluminum matrix. 4,200,767, Cl. 174-126.00S.
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, to Nippon Gakki Seizo Kabushiki Kaisha. Integrated semiconductor device including static induction transistor. 4,200,879, Cl. 357-43.000.
Nonumura, Koutaro: *See*—
Kasahara, Nobuyoshi; and Nonumura, Koutaro, 4,200,475, Cl. 148-6.100.
Norco, Inc.: *See*—
Metz, Joseph R., 4,199,999, Cl. 74-424.8NA.
Norddeutsche Affinerie: *See*—
Berndt, Gerhard; Kapell, Gerhard; Schummer, Anton; and Hansen, Uwe J., 4,200,265, Cl. 266-212.000.
Nordson Corporation: *See*—
Akers, Larry D.; and Scholl, Charles H., 4,200,207, Cl. 222-190.000.
Norlin Industries, Inc.: *See*—
Monnier, Dan E., 4,200,842, Cl. 328-42.000.
Northrop Corporation: *See*—
Cushman, Glenn F., 4,200,925, Cl. 364-107.000.
Novak, Raymond F.; Doyle, Richard; and Frank, Edmund, to Duo-Fast Corporation. Compression tacker. 4,200,215, Cl. 227-123.000.
Nozaki, Mineo; Asakura, Osamu; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Printer hammer assembly. 4,200,043, Cl. 101-93.290.
NTN Toyo Bearing Company Limited: *See*—
Kimata, Kei; and Nakazeki, Tsugito, 4,200,120, Cl. 137-613.000.
Nudelman, Abraham; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. 7-2-Indolyl acetamido cephalosporin derivatives. 4,200,747, Cl. 544-27.000.
Numata, Mitsuo; and Nishimura, Tatsuo, to Takeda Chemical Industries, Ltd. 7[(2-Thiazolyl)-2-(oxoimino)acetamido]cephalosporin derivatives. 4,200,575, Cl. 424-246.000.
Nunan, Craig S., to Varian Associates. Racetrack microtron beam extraction system. 4,200,844, Cl. 328-230.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., to William H. Rorer, Inc. Method of treatment. 4,200,648, Cl. 424-308.000.
N.V. Optische Industrie "De Oude Delft": *See*—
Duinker, Simon, 4,200,931, Cl. 364-414.000.
Obayashi, Hideki: *See*—
Egami, Tsuneyuki; Kawai, Hisasi; Kohama, Tokio; and Obayashi, Hideki, 4,200,843, Cl. 328-142.000.
Obendorf, Johann: *See*—
Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, 4,200,725, Cl. 528-49.000.
Oberg, Karl-Erik; and Bertheussen, Harry, to Scandinavian Lancers Aktiebolag. Method for the alloying of a metal melt. 4,200,458, Cl. 75-129.000.
Occidental Oil Shale, Inc.: *See*—
Burton, Robert S., III, 4,200,336, Cl. 299-2.000.
Ochiai, Hirokazu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.
Ochiai, Yoshinori: *See*—
Murakami, Fumio; Enya, Takeshi; and Ochiai, Yoshinori, 4,200,796, Cl. 250-402.000.
Ochs, Charles S.; and Herzog, James M., to Anchor Hocking Corporation. Sealing machine closure cap pickup. 4,199,914, Cl. 53-314.000.
O'Connell, Lawrence E.; and Nichols, George F., to Delbar Products, Inc. Assembly and method to extend useful life of sputtering targets. 4,200,510, Cl. 204-192.00R.
Oehlke, Donald N., to Eaton Corporation. Fastening device. 4,200,027, Cl. 85-36.000.
Ogasawara, Toshichika: *See*—
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.
Ogata, Yoshie. Holding appliance for use in a blanket or a coverlet and the like. 4,199,830, Cl. 5-411.000.
Ogawa, Nobuhisa: *See*—
Mochida, Ei; Ogawa, Nobuhisa; Shinkai, Hiroyuki; and Hashimoto, Masakatsu, 4,200,436, Cl. 23-230.00B.
Ogawa, Takuzo: *See*—
Suzuki, Takaya; Ura, Mitsuru; and Ogawa, Takuzo, 4,200,877, Cl. 357-13.000.
O'Hagan, Peter K., to Scapa Canada Ltee. Method and apparatus for handling rolls inside an endless paper-making belt. 4,200,490, Cl. 162-200.000.
Ohashi, Michihiro: *See*—
Kosuda, Tooru; Ohashi, Michihiro; and Katou, Hiromi, 4,200,074, Cl. 123-139.0BG.
Ohba, Koichi: *See*—
Ikemi, Shinichi; and Ohba, Koichi, 4,199,967, Cl. 72-12.000.
Ohlinger, Manfred: *See*—
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.
Ohls, James W., to Corning Glass Works. Method for making an optical waveguide coating die. 4,200,136, Cl. 164-6.000.
Ohmi, Atushi, to Aisin Seiki Kabushiki Kaisha. Diaphragm brake booster. 4,200,029, Cl. 91-369.00A.
Ohmori, Kaoru: *See*—
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, 4,200,632, Cl. 424-230.000.
Ohshio, Hirosuke: *See*—
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.
Oka, Tsumoru: *See*—
Komatsu, Hiroaki; and Oka, Tsumoru, 4,200,773, Cl. 200-11.00R.
Okada, Akiyosi: *See*—
Inami, Fumiaki; and Okada, Akiyosi, 4,200,329, Cl. 296-69.000.
Okada, Fumiaki: *See*—
Masuda, Katsumi; Okada, Fumiaki; and Nishioka, Yoshihiro, 4,199,958, Cl. 62-374.000.
Okada, Isamu; and Inoue, Takehito, to Fuji Electric Co., Ltd. Apparatus for measuring insulation resistance in an operating three-phase ungrounded transmission line system. 4,200,836, Cl. 324-51.000.
Okada, Kaoru: *See*—
Yoshioka, Shigehiko; and Okada, Kaoru, 4,200,562, Cl. 260-29.6RW.
Okamura, Kenichiro; and Nakamuru, Yasuo, to Alpha Techno Company. α-Cyanoacrylate-base adhesive compositions. 4,200,549, Cl. 252-182.000.
Okochi, Kazuo; and Kiyokawa, Hiroyuki, to Sanki Engineering Ltd. Immunological blood test method. 4,200,434, Cl. 23-230.00B.
Okuda, Hirohisa; and Hori, Nobutaka, to Toyo Seiyaku Kasei Co., Ltd. Haloplatinate dental composition for preventing and inhibiting dental caries. 4,200,626, Cl. 424-51.000.
Olodort, Robert A. Film projector with sound playback or recording. 4,200,363, Cl. 352-27.000.
Olson, John R., to Dynex/Rivett Inc. Method and apparatus for hydraulically driving and controlling a cooling fan. 4,200,146, Cl. 165-39.000.
Olsson, Karl B. R.: *See*—
Frode, Per E. L.; and Olsson, Karl B. R., 4,200,687, Cl. 429-130.000.
Olsson, Sven-Gunnar: *See*—
Gedeon, Andras; Olsson, Sven-Gunnar; and Psaros, Georgios, 4,200,094, Cl. 128-201.130.
Olympia Werke AG: *See*—
Rix, Albert, 4,200,402, Cl. 400-354.100.
Olympus Opitcal Co., Ltd.: *See*—
Suzuki, Nobuyoshi, 4,200,607, Cl. 422-64.000.
Olympus Optical Co., Ltd.: *See*—
Itaya, Hideo, 4,200,357, Cl. 350-175.00E.
Yuta, Koichi, 4,200,352, Cl. 350-1.200.
Omini, Marco: *See*—
Malvano, Renato; Omini, Marco; and Carli, Natalino, 4,200,361, Cl. 350-336.000.
Omnium Chimique Societe Anonyme: *See*—
Hannart, Jean A. A. J., 4,200,638, Cl. 424-256.000.
Ondetti, Miguel A.; and Cushman, David W., to E. R. Squibb & Sons, Inc. Relieving hypertension with carboxyalkylacylamino acids. 4,200,649, Cl. 424-309.000.
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, to Tokuyama Soda Kabushiki Kaisha. Process for preparing fluorine-containing polymers having carboxyl groups. 4,200,711, Cl. 525-387.000.
Orthoefer, Frank T., to A. E. Staley Manufacturing Company. Cold-water-dispersible lecithin concentrates. 4,200,551, Cl. 252-312.000.
Orzechowski, Thaddeus J.: *See*—
Bekefi, George; and Orzechowski, Thaddeus J., 4,200,821, Cl. 315-39.510.
Osredek Badawczo-Rozwojowy Maszyn Hutniczych: *See*—
Engel, Zbigniew; Kepinski, Marek; and Grabowski, Idzi, 4,199,969, Cl. 72-76.000.
Ostendorf, Hermann: *See*—
Beine, Burkhard; Ostendorf, Hermann; and Schmidt, Gunter, 4,199,994, Cl. 73-785.000.
Oswald, Richard K., to International Business Machines Corporation. Positioning system employing feedforward and feedback control. 4,200,827, Cl. 318-561.000.
Ott, Anton: *See*—
Ehrlinger, Friedrich; and Ott, Anton, 4,200,006, Cl. 74-681.000.

Oughton, George W.; and Smollinger, Glenn J., to ESB Incorporated. Series resonant battery charger and control therefor. 4,200,830, Cl. 320-32.000.

Outboard Marine Corporation: *See—*
Cavil, David T.; and Krueger, William R., 4,200,078, Cl. 123-148.0CC.

Owens-Corning Fiberglas Corporation: *See—*
Seymour, Merritt W.; Wyerman, Barry R.; and Steffy, Gary R., 4,200,171, Cl. 181-287.000.

Owens-Illinois, Inc.: *See—*
Berg, Charles A., 4,199,952, Cl. 62-2.000.
Doherty, Thomas E., 4,199,851, Cl. 29-235.000.
Keyes, Melvin H.; and Moore, Garry L., 4,200,238, Cl. 241-21.000.
Miller, John W. V., 4,200,822, Cl. 315-169.400.
Riggs, Darius O., 4,200,183, Cl. 198-648.000.

Owens, James H., to Armco Inc. Well riser support having elastomeric bearings. 4,199,847, Cl. 24-249.0DP.

Oxoid Limited: *See—*
Swaine, Derwent; Spong, Henry K.; and Lewin, Brian M., 4,200,610, Cl. 422-239.000.

Oy Wartsila AB: *See—*
Toropainen, Jorma, 4,200,045, Cl. 101-217.000.

Ozias, Walter T., Jr.: *See—*
Reid, Kenneth H.; and Ozias, Walter T., Jr., 4,200,311, Cl. 280-801.000.

P. R. Mallory & Co. Inc.: *See—*
Bro, Per, 4,200,684, Cl. 429-51.000.

Paciorek, Kazimiera J. L.: *See—*
United States of America, National Aeronautics and Space Administration; and Paciorek, Kazimiera J. L., 4,200,721, Cl. 526-261.000.

Packard, Douglas R.: *See—*
Grossman, Leonard N.; and Packard, Douglas R., 4,200,460, Cl. 75-177.000.

Page, Robert E.; and Brackett, Raymond B., to United States of America, Navy. Apparatus for expanding the memory of a mini-computer system. 4,200,919, Cl. 365-230.000.

Pagendarm, Lawrence J.: *See—*
Klootwyk, Ronald I.; and Pagendarm, Lawrence J., 4,200,685, Cl. 429-70.000.

Palosi, Eva: *See—*
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.

Panek, Edward J.; Moll, Werner O.; Bergman, Lee H.; and Kersten, Siegfried P., to BASF Wyandotte Corporation. Silicate fouling control during dihydric alcohol distillation. 4,200,501, Cl. 203-7.000.

Pantier, Earl A.: *See—*
Jackovitz, John F.; and Pantier, Earl A., 4,200,337, Cl. 299-5.000.

Papamantellos, Demetrios C.: *See—*
Hatzinicolaides, John A.; and Papamantellos, Demetrios C., 4,200,453, Cl. 75-52.000.

Pappas, James A.: *See—*
Schroeder, Karl; and Pappas, James A., 4,200,202, Cl. 221-150.00R.

Parker, Donald L.: *See—*
Mathues, Thomas P.; and Parker, Donald L., 4,199,940, Cl. 60-547.00R.
Mathues, Thomas P.; and Parker, Donald L., 4,199,947, Cl. 60-547.00R.
Mathues, Thomas P.; and Parker, Donald L., 4,199,948, Cl. 60-553.000.

Parker, George. Awning. 4,200,115, Cl. 135-5.00A.

Parker-Hannifin Corporation: *See—*
Adams, Cecil L.; and Warner, Norman E., 4,199,960, Cl. 62-503.000.

Pasternack, Adalbert: *See—*
Warncke, Ernst; and Pasternack, Adalbert, 4,200,092, Cl. 128-202.260.

Patchornik, Abraham: *See—*
Nudelman, Abraham; and Patchornik, Abraham, 4,200,747, Cl. 544-27.000.

Paulin, Kenneth L., Sr. Automatic choke. 4,200,069, Cl. 123-119.00F.

Peabody Coal Company: *See—*
Moynihan, Daniel J.; and Campbell, John A. L., 4,200,335, Cl. 299-1.000.

Pearne, Frank S. Control system for moped motor. 4,200,164, Cl. 180-206.000.

Pearson, Jackie B.: *See—*
Glasscock, David E.; and Pearson, Jackie B., 4,199,832, Cl. 6-1.000.

Pechner, Murray. Heat exchanger with fluid turbulator. 4,200,149, Cl. 165-109.000.

Pedersen, Svend E.; and Sheng, Ming N., to Atlantic Richfield Company. Maleic anhydride production over modified phosphotungstic catalyst. 4,200,584, Cl. 260-346.750.

Peelman, Harold E.: *See—*
Richter, Albert P., Jr.; and Peelman, Harold E., 4,199,953, Cl. 62-3.000.

Peev, Vassil G.: *See—*
Savov, Peter H.; Peev, Vassil G.; Valchev, Alexander Y.; and Lingorski, Nikola A., 4,200,452, Cl. 75-12.000.

Penington, George W., Jr. Stairway climbing device. 4,200,161, Cl. 180-8.00A.

Pennekamp, Ingbert, to H. Strunck GmbH & Co. Maschinenfabrik. Method and apparatus for cleaning ampules or similar containers. 4,200,470, Cl. 134-1.000.

Pennings, Albertus J.; and Vossebeld, Arnold, to Stamicarbon, B.V. Compositions possessing increased building tack on the basis of new rubber-like copolymers of ethylene, at least one other α-alkene and one or more polyenes. 4,200,579, Cl. 260-33.6AQ.

Pennings, Albertus J.; and Vossebeld, Arnold, to Stamicarbon, B.V. Rubber-like copolymers of ethylene, at least one other α-alkene and one or more polyenes possessing increased building tack. 4,200,722, Cl. 526-282.000.

Penzien, Klaus: *See—*
Gausepohl, Hermann; Naarmann, Herbert; Penzien, Klaus; and Stephan, Rudolf, 4,200,702, Cl. 525-72.000.

Pepelnik, Rudolf: *See—*
Fanger, Hans-Ulrich; Pepelnik, Rudolf; and Michaelis, Walfried, 4,200,792, Cl. 250-359.000.

Perchonock, Carl D.: *See—*
Holden, Kenneth G.; and Perchonock, Carl D., 4,200,754, Cl. 546-150.000.

Perkins, Lee E., to Perkins, Lee E. Fluid retarded accelerating jar with negative and positive pressure chambers. 4,200,158, Cl. 175-297.000.

Perkins, William A.; and Tanner, William J., to Aladdin Industries, Incorporated. Vacuum bottle construction. 4,200,199, Cl. 220-420.000.

Perner, Johannes; Greif, Norbert; Fikentscher, Rolf; and Diessel, Paul, to BASF Aktiengesellschaft. Iodine-containing block copolymers of 1,4-butylene oxide and ethylene oxide. 4,200,733, Cl. 528-417.000.

Personal Products Company: *See—*
Black, Adam R.; and Timlin, James J., 4,200,103, Cl. 128-290.00W.
Chatterjee, Pronoy K.; and Schwenker, Robert F., Jr., 4,200,557, Cl. 260-17.00A.

Persson, Anders; and Soderstrom, Sven-Erik, to ASEA Aktiebolag. Automatic visibility measuring system. 4,200,398, Cl. 356-437.000.

Peschel, Eberhard; Rathkamp, Hermann; Katzorke, Klaus; and Jurgens, Rainer, to Christensen, Inc. Cutter head, drill bit and similar drilling tools. 4,200,159, Cl. 175-329.000.

Peterlein, Karl; Schulde, Felix; Diedrich, Klaus M.; and Kulisch, Volker W., to Chemische Werke Huls A.G. Anionic paper surface sizing agent. 4,200,559, Cl. 260-17.4ST.

Petersen, Otto; and Schmidt, Hans-Dieter, to Bayer Aktiengesellschaft. Electrochemical detection of phosgene in gas mixtures. 4,200,512, Cl. 204-195.00R.

Peterson, Bertel R., to FBM International, Inc. Cup loader machine. 4,199,918, Cl. 53-537.000.

Peterson, John I.; and Goldstein, Seth R., to United States of America, America. Fiber optic pH probe. 4,200,110, Cl. 128-634.000.

Peterson, Robert W.: *See—*
Forward, Robert L.; and Peterson, Robert W., 4,199,989, Cl. 73-430.000.

Peterson, Russell I., Jr., to Conair, Inc. Comminution device. 4,200,243, Cl. 241-224.000.

Petitti, Angelo, Jr. Racquet weight system. 4,200,285, Cl. 273-29.00A.

Petrick, Michael; Pierson, Edward S.; and Schreiner, Felix, to United States of America, Energy. MHD Generating system. 4,200,815, Cl. 310-11.000.

Petrolite Corporation: *See—*
Quinlan, Patrick M., 4,200,633, Cl. 424-246.000.
Quinlan, Patrick M., 4,200,634, Cl. 424-246.000.

Petter Power Generation Limited: *See—*
Darlington, Jack, 4,200,079, Cl. 123-179.00G.

Petty, Richard H. Grass cutter and mulcher for rotary lawn mower. 4,199,926, Cl. 56-295.000.

Pez, Guido, to Allied Chemical Corporation. Process for polymerizing acetylene. 4,200,716, Cl. 526-141.000.

Pfenninger, Hans, to BBC Brown Boveri & Company Limited. Power plant with pressurized-gas generator. 4,199,933, Cl. 60-39.120.

Pfizer Inc.: *See—*
Bax, Ronald F., 4,200,797, Cl. 250-402.000.
Schnur, Rodney C., 4,200,642, Cl. 424-272.000.

Pfleiderer, Hans-Joerg: *See—*
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,200,848, Cl. 333-165.000.

Pflug, Hannes: *See—*
Kauhl, Gunther; Pflug, Hannes; and Steinke, Leo, 4,200,077, Cl. 123-145.00A.

Phillips Petroleum Company: *See—*
Drake, Charles A., 4,200,586, Cl. 260-464.000.
Gragson, James T., 4,200,602, Cl. 264-28.000.

Phreaner, Andrew W. Brush type drumstick. 4,200,026, Cl. 84-422.00S.

Pico Electronics Limited: *See—*
Campbell, David C.; and Thompson, David R., 4,200,862, Cl. 340-310.00A.

Pierson, Edward S.: *See—*
Petrick, Michael; Pierson, Edward S.; and Schreiner, Felix, 4,200,815, Cl. 310-11.000.

Pilkington Brothers Limited: *See—*
Dickinson, George A., 4,200,448, Cl. 65-134.000.

Pilkington P. E. Limited: *See—*
Freeman, Michael H., 4,200,366, Cl. 353-78.000.

Pindar, John F.: *See—*
Clason, Donald L.; Pindar, John F.; and Cohen, Jerome M., 4,200,545, Cl. 252-33.400.

Pioneer Electronic Corporation: *See—*
Ikedo, Yuji, 4,200,295, Cl. 274-15.00R.

Piras, Giancarlo, to Euteco S.p.A. Parallel multiprocessing system for an industrial plant. 4,200,226, Cl. 371-9.000.
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, to BASF Aktiengesellschaft. Flexible multilayer magnetic recording medium. 4,200,678, Cl. 428-329.000.
Pitts, Frank, to Engelhard Minerals & Chemicals Corporation. Preparation of magnesium chloride. 4,200,618, Cl. 423-163.000.
Plas/Steel Products, Inc.: *See*—
Fish, Elson B., 4,200,126, Cl. 138-143.000.
Platt Saco Lowell Limited: *See*—
Goetzinger, David J., 4,199,844, Cl. 19-240.000.
Pluim, Cornelius, to Cast-Tec Ltd. Linear permanent mould casting system. 4,200,139, Cl. 164-72.000.
Plummer, Dexter R.: *See*—
Ridler, Keith D.; and Plummer, Dexter R., 4,200,828, Cl. 318-558.000.
Pohl, Walter J., to General Electric Company. Circuit for protecting induction motors. 4,200,829, Cl. 318-782.000.
Poirier, Fernando: *See*—
Duhamel, Ernest; and Poirier, Fernando, 4,200,102, Cl. 128-286.000.
Poitevin, Jean-Pierre R. Apparatus for evaluating the error rate of binary digital signals. 4,200,838, Cl. 371-22.000.
Pokrzywa, Alan S. Gas valve lock. 4,200,128, Cl. 141-392.000.
Polaroid Corporation: *See*—
Bendoni, Leonard V.; and Fischer, Richard V., 4,200,383, Cl. 354-304.000.
Douglas, Lawrence M., 4,200,367, Cl. 353-78.000.
Erlichman, Irving, 4,200,379, Cl. 354-196.000.
Friedman, Harvey S., 4,200,382, Cl. 354-304.000.
Johnson, Bruce K., 4,200,373, Cl. 354-53.000.
Josephson, Donald G.; and Sorli, Duncan C., 4,200,384, Cl. 354-304.000.
Shenk, Edwin K., 4,200,378, Cl. 354-195.000.
Svatek, Thomas A., 4,200,392, Cl. 355-45.000.
Poling, Ronald W., to General Electric Company. Control device with grain oriented snap disk. 4,200,776, Cl. 200-83.00P.
Pollermann, Max: *See*—
Becker, Veit; Feinendegen, Ludwig; and Pollermann, Max, 4,200,803, Cl. 250-505.000.
Polselli, Luigi; and Polselli, Rudolph. Door fastener. 4,200,317, Cl. 292-293.000.
Polselli, Rudolph: *See*—
Polselli, Luigi; and Polselli, Rudolph, 4,200,317, Cl. 292-293.000.
Polymer Corporation, The: *See*—
Swavely, Donald F., 4,199,859, Cl. 29-526.00R.
Pomerantzeff, Oleg, to Retina Foundation. Ophthalmoscope with uniform illumination. 4,200,362, Cl. 351-16.000.
Pope, Billy C.: *See*—
Johnston, Bobby M.; and Pope, Billy C., 4,199,900, Cl. 49-404.000.
Pope, Kenneth E., to Combustion Engineering, Inc. Electrostatic coalescing system. 4,200,516, Cl. 204-302.000.
Porep, Hans-Juergen: *See*—
Guenzel, Peter; Rosskamp, Guenter; Kolberg, Reiner; and Porep, Hans-Juergen, 4,200,099, Cl. 128-266.000.
Portele, Ludwig: *See*—
Walter, Friedrich C.; and Portele, Ludwig, 4,200,121, Cl. 137-614.050.
Porter, John T., II, to General Atomic Company. Separation of uranium isotopes. 4,200,507, Cl. 204-158.00R.
Potzlberger, Hans W.: *See*—
Munz, Wolf-Dieter; Bock, Siegfried; and Potzlberger, Hans W., 4,200,502, Cl. 204-15.000.
Powell, Richard G., to United States of America, Agriculture. Sesbanine and the use thereof in treating leukemic tumors. 4,200,639, Cl. 424-256.000.
PPG Industries, Inc.: *See*—
Cathers, William P.; and Dorn, Charles W., Jr., 4,200,420, Cl. 414-107.000.
Koontz, Harry S., 4,200,446, Cl. 65-25.00A.
PQ Corporation: *See*—
Cassella, Vincent J.; and Irani, Mazin R., 4,200,527, Cl. 210-49.000.
Cassella, Vincent J.; and Irani, Mazin R., 4,200,528, Cl. 210-49.000.
Prab Conveyors, Inc.: *See*—
Van Nocker, Melvin; and Larson, Charles R., 4,200,185, Cl. 198-718.000.
Pratt & Lambert, Inc.: *See*—
Wolinski, Leon E.; and Berezuk, Peter D., 4,200,480, Cl. 156-294.000.
Precision Industries, Inc.: *See*—
Kezran, Mitchell, 4,200,416, Cl. 407-108.000.
Preiss, Michael: *See*—
Feyen, Peter; Preiss, Michael; and Metzger, Karl G., 4,200,576, Cl. 424-246.000.
Preslar, Donald R.: *See*—
Beelitz, Howard R.; and Preslar, Donald R., 4,199,860, Cl. 29-577.00C.
PressMaster A.B.: *See*—
Wiener, Hans, 4,199,972, Cl. 72-409.000.
Price, George B.; and Kielmeyer, William H., to Johns-Manville Corporation. Method for making high purity, devitrification resistant, amorphous silica fibers. 4,200,485, Cl. 423-335.000.
Prihoda, John R.: *See*—
Muehlenbrock, Dale R.; Prihoda, John R.; and Singleton, Leonard, Jr., 4,200,734, Cl. 528-503.000.
Princeton Electronic Products, Inc.: *See*—
Hofstein, Steven R., 4,200,885, Cl. 358-112.000.
Priore, Alfred J. T-shaped edge finishing strips and their production. 4,199,910, Cl. 52-716.000.
Prochazka, Bretislav: *See*—
Vagac, Svetozar; Prochazka, Bretislav; Mueller, Jiri; Kostka, Anton; and Carsky, Milan, 4,200,486, Cl. 162-8.000.
Procter & Gamble Company, The: *See*—
Drobish, James L., 4,200,090, Cl. 128-127.000.
Kitko, David J., 4,200,606, Cl. 422-37.000.
Seguine, Edward S., 4,200,509, Cl. 204-186.000.
Projektierung Chemische Verfahrenstechnik GmbH: *See*—
Kaimann, Walter; and Brachthauser, Karl-Heinz, 4,200,438, Cl. 48-73.000.
Puls, Jurgen; Sinner, Michael; and Dietrichs, Hans-Hermann, 4,200,692, Cl. 435-99.000.
Protoned B.V.: *See*—
Brauning, Egon, 4,200,332, Cl. 297-300.000.
Prussin, Samuel: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,200,664, Cl. 427-4.000.
Psaros, Georgios: *See*—
Gedeon, Andras; Olsson, Sven-Gunnar; and Psaros, Georgios, 4,200,094, Cl. 128-201.130.
Puls, Jurgen; Sinner, Michael; and Dietrichs, Hans-Hermann, to Projektierung Chemische Verfahrenstechnik GmbH. Process for the production of xylose by enzymatic hydrolysis of xylan. 4,200,692, Cl. 435-99.000.
Puryear, John W., to Brunswick Corporation. Internal disc drag for spinning reel. 4,200,248, Cl. 242-84.51A.
Quanta-Ray, Inc.: *See*—
Herbst, Richard L., 4,200,808, Cl. 307-425.000.
Queener, Carl A., to International Business Machines Corporation. Copier/collator with extended collate functions. 4,200,386, Cl. 355-14.0SH.
Queens University at Kingston: *See*—
Wolfe, Saul, 4,200,571, Cl. 260-239.00A.
Quick, Gary R.: *See*—
Ladbrooke, Brian D.; Quick, Gary R.; and Singer, Norman S., 4,200,569, Cl. 260-112.00G.
Quick, Graeme R.; Harris, Walter E.; Riddle, Ernest J.; and Robinson, Terrence S., to White Motor Corporation of Canada Ltd. Crop harvesting machine. 4,199,925, Cl. 56-208.000.
Quinlan, Patrick M., to Petrolite Corporation. Thioether containing quaternary ammonium derivatives of 1,4-thiazines as microbiocides. 4,200,633, Cl. 424-246.000.
Quinlan, Patrick M., to Petrolite Corporation. Sulfone containing quaternary ammonium derivatives of 1,4-thiazines as microbiocides. 4,200,634, Cl. 424-246.000.
RA-Shipping Ltd. OY: *See*—
Myreen, Bertel, 4,200,600, Cl. 261-147.000.
Racine, Gene A. Fuel/air mixture control for supercharged internal combustion engines. 4,200,070, Cl. 123-122.0AC.
Raffel, Reiner; Hauptmann, Gunter; Reffelmann, Gerd; and Ebeling, Wilfried, to Maschinenfabrik Hennecke GmbH. Process and equipment for the continuous production of block-shaped foam. 4,200,603, Cl. 264-51.000.
Rahn, Martin: *See*—
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.
Rakshys, Joseph W.: *See*—
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., 4,200,718, Cl. 526-173.000.
Ramco Laboratories Inc.: *See*—
Alfrey, Clarence P.; and Bedford, Donald B., 4,200,613, Cl. 422-71.000.
Ramich, Gary A., to American Can Company. Container for liquid product. 4,200,219, Cl. 229-16.00A.
Ramsay, James W.: *See*—
Cowan, Samuel J.; Gerend, Robert P.; Ramsay, James W.; and Shivashankara, Belur N., 4,199,936, Cl. 60-226.00R.
Ranco Incorporated: *See*—
Gliatas, Themistocles H., 4,200,258, Cl. 251-214.000.
Rathkamp, Hermann: *See*—
Peschel, Eberhard; Rathkamp, Hermann; Katzorke, Klaus; and Jurgens, Rainer, 4,200,159, Cl. 175-329.000.
Rautela, Gopal S.: *See*—
Buege, John A.; Hickey, Michael E.; and Rautela, Gopal S., 4,200,691, Cl. 435-17.000.
Rawlings, Robert L.; and Mathews, Ronald D., to Burroughs Corporation. Adapter cluster module for data communications subsystem. 4,200,930, Cl. 364-200.000.
Raychem Corporation: *See*—
Caponigro, Dennis A.; and Lopez, Eugene F., 4,200,676, Cl. 428-57.000.
Raymond, Russell J.: *See*—
Evani, Syamalarao; and Raymond, Russell J., 4,200,720, Cl. 526-233.000.
RCA Corporation: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,200,811, Cl. 307-225.00R.
Beelitz, Howard R.; and Preslar, Donald R., 4,199,860, Cl. 29-577.00C.
Carlson, David E., 4,200,473, Cl. 136-89.0SJ.
Carnt, Peter S.; Rutishauser, Ernst A. O.; and Schiess, Jorg, 4,200,881, Cl. 358-4.000.

Ipri, Alfred C., 4,200,878, Cl. 357-35.000.
Kleinknecht, Hans P.: and Bosenberg, Wolfram A., 4,200,396, Cl. 356-384.000.
Turner, Clarence C., 4,200,274, Cl. 269-319.000.
Weimer, Paul K., 4,200,892, Cl. 358-213.000.
Reamy, John C. Farrier's hammer. 4,200,130, Cl. 145-29.00R.
Reber, Kurt: *See—*
Bollag, Werner; and Reber, Kurt, 4,200,647, Cl. 424-305.000.
Reed, Walter R.: *See—*
Stahl, Philip; Moskowitz, Ronald; and Reed, Walter R., 4,200,296, Cl. 277-80.000.
Reese, Max G., to Becton, Dickinson and Company. Immobilized binder for automated assay. 4,200,625, Cl. 424-1.000.
Reeves, Lewis G. Fishing line guiding device. 4,199,892, Cl. 43-43.130.
Reffelmann, Gerd: *See—*
Raffel, Reiner; Hauptmann, Gunter; Reffelmann, Gerd; and Ebeling, Wilfried, 4,200,603, Cl. 264-51.000.
Regan Offshore International, Inc.: *See—*
Watkins, Bruce J., 4,200,312, Cl. 285-18.000.
Reh, Lothar: *See—*
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.
Reichelt, Walter H.: *See—*
Stark, Eugene E., Jr.; Kephart, John F.; Leland, Wallace T.; and Reichelt, Walter H., 4,200,846, Cl. 331-94.50R.
Reid, Kenneth H.; and Ozias, Walter T., Jr., to General Motors Corporation. Seat belt securing device. 4,200,311, Cl. 280-801.000.
Reid, Robert L. Vascular connector for effecting vascular duct closure and permitting vascular re-opening. 4,200,107, Cl. 128-305.000.
Reider, Malcolm J.: *See—*
Johnson, Earl W.; Reider, Malcolm J.; Anewalt, Robert; and Kring, Harry J., 4,200,526, Cl. 210-23.00H.
Reinberg, Alan R., to Texas Instruments Incorporated. Single component monomer for silicon nitride deposition. 4,200,666, Cl. 427-39.000.
Renko, Ronald J., to Air Preheater Company, Inc., The. Filter construction. 4,200,440, Cl. 55-131.000.
Reofon A/S: *See—*
Madsen, Birger B., 4,200,809, Cl. 307-132.00R.
Repp, Arno, to Robert Bosch GmbH. Scanning head structure for wide band magnetic record/reproducing tape and method of its manufacture. 4,200,895, Cl. 360-107.000.
Republic Corporation: *See—*
Wilcox, Raymond J., 4,200,326, Cl. 295-23.000.
Republic Steel Corporation: *See—*
Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., 4,200,137, Cl. 164-49.000.
Reti, Adrian R., to Millipore Corporation. Arrangement for intravenous administration or the like. 4,200,095, Cl. 128-214.00C.
Retina Foundation: *See—*
Pomerantzeff, Oleg, 4,200,362, Cl. 351-16.000.
Reymond, Jean C.: *See—*
Hawkes, Thaddeus; Reymond, Jean C.; and Trocellier, Roger, 4,200,356, Cl. 350-96.160.
Rhodes, William A. Sparged air distilled water recovery system. 4,200,497, Cl. 202-197.000.
Rice, David: *See—*
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.
Richards, John S.; and DePaoli, Alan G., to Information National, Inc. Method and apparatus for compacting and decompacting character data in accordance with a variety of methods. 4,200,369, Cl. 354-7.000.
Richardson, David W.; and Husker, Colin, to Harker Co., Ltd. Evaporator assembly. 4,199,957, Cl. 62-275.000.
Richardson-Merrell Inc.: *See—*
Grisar, J. Martin; and Claxton, George P., 4,200,755, Cl. 546-199.000.
Richardson, Paul N., to Du Pont de Nemours, E. I., and Company. Polyamide nucleated with zinc phenyl phosphinate or zinc phenyl phosphonate. 4,200,707, Cl. 525-2.000.
Richmond, John-Russel: *See—*
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.
Richter, Albert P., Jr.; and Peelman, Harold E., to Texaco Inc. Temperature stabilization system. 4,199,953, Cl. 62-3.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.
Ricoh Company, Ltd.: *See—*
Hasebe, Mitsuo; Watanabe, Mutsuo; Hibi, Kunio; and Watanuki, Masayosi, 4,200,388, Cl. 355-3.0DD.
Masumura, Masao, 4,200,387, Cl. 355-3.0DD.
Sakamoto, Koji; Tatsumi, Susumu; and Imai, Chikara, 4,200,391, Cl. 355-14.00E.
Riddle, Ernest J.: *See—*
Quick, Graeme R.; Harris, Walter E.; Riddle, Ernest J.; and Robinson, Terrence S., 4,199,925, Cl. 56-208.000.
Ridenour, Ralph G. Tube fitting assembly. 4,200,314, Cl. 285-382.500.
Rider, Jerald R., to Combustion Engineering, Inc. Control device for batch metering system. 4,200,203, Cl. 222-14.000.
Ridler, Keith D.; and Plummer, Dexter R., to Streathern Audio Limited. Pivoted arm control arrangement. 4,200,828, Cl. 318-558.000.
Riegger, Hubertus, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sampling apparatus for chromatographic instruments. 4,199,988, Cl. 73-422.0GC.
Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Rotary slide closure. 4,200,210, Cl. 222-598.000.
Riegler, Ernst; and Schmidt, Manfred, to Voest-Alpine Aktiengesellschaft. Mixing arrangement. 4,200,266, Cl. 266-236.000.
Riggs, Darius O., to Owens-Illinois, Inc. Apparatus for moving glass containers through a series of inspection positions. 4,200,183, Cl. 198-648.000.
Rilling, Raymond J.: *See—*
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,200,155, Cl. 172-14.000.
Ring, Michael: *See—*
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,200,488, Cl. 162-101.000.
Rinker, Kurt H.: *See—*
Evans, Anthony C.; Goering, Karl; and Rinker, Kurt H., 4,200,173, Cl. 188-73.300.
Risse, Jean-Claude: *See—*
Schneider, Bruno; Nigg, Fritz; and Risse, Jean-Claude, 4,200,246, Cl. 242-67.400.
Ritter, Fridolin J., to Nederlandse Centrale Organisatie Voor Toegepast Natuurwetenschappelijk Onderzoek. (6E,10Z)-3,4,7,11-Tetramethyl-6,10-tridecadienal-1. 4,200,590, Cl. 260-601.00R.
Rittinger, Herbert, to Helmut Darda Spielwaren und Maschinenbau GmbH Im Tal. Apparatus for braking and starting spring-driven cars. 4,199,893, Cl. 46-1.00K.
Rix, Albert, to Olympia Werke AG. Carriage guide for typing element carrier. 4,200,402, Cl. 400-354.100.
Rizzotti, Robert: *See—*
Brigand, Gerard; Kragen, Horst; and Rizzotti, Robert, 4,200,661, Cl. 426-573.000.
Robert Bosch GmbH: *See—*
Espenschied, Helmut; Kiencke, Uwe; and Schulz, Alfred, 4,200,007, Cl. 74-859.000.
Hager, Klaus; and Voss, Klaus, 4,200,417, Cl. 408-67.000.
Kauhl, Gunther; Pflug, Hannes; and Steinke, Leo, 4,200,077, Cl. 123-145.00A.
Maurer, Helmut; Linder, Ernst; and Dillmann, Gerhard, 4,200,071, Cl. 123-124.00R.
Repp, Arno, 4,200,895, Cl. 360-107.000.
Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, 4,200,076, Cl. 123-140.0CC.
Robertshaw Controls Company: *See—*
McGeorge, Gram, 4,200,900, Cl. 361-412.000.
Robinson, Joseph G.; and Herbert, Lesley D., to Coal Industry (Patents) Limited. Reinforced rubber. 4,200,556, Cl. 260-3.000.
Robinson, Terrence S.: *See—*
Quick, Graeme R.; Harris, Walter E.; Riddle, Ernest J.; and Robinson, Terrence S., 4,199,925, Cl. 56-208.000.
Robinson, Tibor: *See—*
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,200,564, Cl. 260-29.40R.
Rockwell International Corporation: *See—*
Friefeld, Jerome M.; and Silverman, Jacob, 4,200,148, Cl. 165-104.00S.
Glass, Howard L., 4,200,484, Cl. 156-622.000.
Strathman, Lyle R., 4,200,866, Cl. 340-703.000.
Rod Pierce and Associates: *See—*
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,200,201, Cl. 221-129.000.
Roda, Emilio, to Roda Macchine S.A. Machine for erecting sheet material packaging articles. 4,200,032, Cl. 93-37.0SP.
Roda Macchine S.A.: *See—*
Roda, Emilio, 4,200,032, Cl. 93-37.0SP.
Roeder, Robert S.; and Bomar, Lucien C., II, to Sperry Corporation. Acquisition system for continuous-wave frequency modulation object detector. 4,200,871, Cl. 343-7.400.
Roessler, David M.: *See—*
Kimble, Harry J.; and Roessler, David M., 4,200,399, Cl. 356-437.000.
Rogers, Norman H., to Beecham Group Limited. Antibacterially active amides. 4,200,635, Cl. 424-248.570.
Rogers, William J., Jr. Assembly for positioning portable structures. 4,200,419, Cl. 414-12.000.
Rohm, Gunter H. Lathe chuck with removable jaws. 4,200,300, Cl. 279-1.00C.
Rohm and Haas Company: *See—*
Chong, Berni P.; Isacoff, Eric G.; and Neely, James W., 4,200,695, Cl. 521-28.000.
Goldman, Theodore D.; and Farham, Sutton B., 4,200,567, Cl. 260-40.00R.
Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See—*
Schramm, Peter; Schuhmann, Siegfried; Schoneberger, Edgar F.; Dorn, Alfred; and Cappel, Bert, 4,200,932, Cl. 364-519.000.
Roldiva, Inc.: *See—*
Carter, Larry D.; and Clark, Silas W., 4,199,961, Cl. 62-535.000.
Romano, John V., to Atari, Inc. Control assembly with rotating disc cover for sliding control. 4,200,780, Cl. 200-302.000.

Root, David M.; and Cole, Francis X., to Millipore Corporation. Immunoassay with membrane immobilized antibody. 4,200,690, Cl. 435-7.090.

Rosskamp, Guenter: *See—*
Guenzel, Peter; Rosskamp, Guenter; Kolberg, Reiner; and Porep, Hans-Juergen, 4,200,099, Cl. 128-266.000.

Rotographic Machinery: *See—*
Helmig, Richard W.; and Berwick, Clinton L., 4,200,016, Cl. 83-88.000.

Rouleaux, Hubertus H.: *See—*
Kielersreiter, Fritz; and Rouleaux, Hubertus H., 4,199,971, Cl. 72-336.000.

Rowarth, Ralph, to British Aerospace. Aircraft wing drooping leading edge device. 4,200,253, Cl. 244-219.000.

Rowatt, Robert J.: *See—*
Lynch, Thomas J.; and Rowatt, Robert J., 4,200,715, Cl. 526-88.000.

Roy, Kenneth L.; and Fugate, Philip E., to Ledex, Inc. Print wire solenoid. 4,200,401, Cl. 400-124.000.

Ruffing, Charles R.; Gause, Smith A.; Botts, John C.; and Smith, Harry E., to Westinghouse Electric Corp. Resin impregnated aromatic polyamide covered glass based slot wedge for large dynamoelectric machines. 4,200,818, Cl. 310-214.000.

Ruti Machinery Works Ltd.: *See—*
Kielersreiter, Fritz; and Rouleaux, Hubertus H., 4,199,971, Cl. 72-336.000.

Ruti-Te Strake B.V.: *See—*
Kielersreiter, Fritz; and Rouleaux, Hubertus H., 4,199,971, Cl. 72-336.000.

Rutishauser, Ernst A. O.: *See—*
Carnt, Peter S.; Rutishauser, Ernst A. O.; and Schiess, Jorg, 4,200,881, Cl. 358-4.000.

Ryan, John W.; and Moore, James D., to Ideal Toy Corporation. Remotely controlled miniature vehicle. 4,200,287, Cl. 273-86.00B.

Ryan, Ralph L., to JRC Products Inc. Core locking device. 4,200,301, Cl. 279-2.00A.

Ryan, Robert E.: *See—*
Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., 4,200,137, Cl. 164-49.000.

Ryder International Corporation: *See—*
Thomas, Michael D., 4,200,187, Cl. 206-5.100.

Rymarczyk, James W.: *See—*
Hughes, Jeffrey F.; Liptay, John S.; Rymarczyk, James W.; and Stone, Stanley E., 4,200,927, Cl. 364-200.000.

S. & R. Food Co., Inc.: *See—*
Seeley, Robert D.; and Seeley, Richard B., 4,200,663, Cl. 426-614.000.

Saadeh, Fuad T.; and Fontaine, Marc F., to Texaco Inc. Methods and hydraulically expandable self-cleaning sand screens. 4,200,150, Cl. 166-231.000.

Sacks, Jack: *See—*
Hubach, Richard A.; DeZotell, Gary L.; and Sacks, Jack, 4,200,861, Cl. 340-146.30Q.

Sadek, Kadry: *See—*
Hausler, Michael; and Sadek, Kadry, 4,200,907, Cl. 363-35.000.

Safety Products: *See—*
Keeran, William C.; and Lakickas, Edward, 4,200,823, Cl. 315-241.00R.

Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, to Toyama Chemical Company, Limited. Substituted 7α-methoxy-7β[(2,3-dioxo-1-piperazinyl)carbonylamino-phenylacetamido]cephalosporins. 4,200,744, Cl. 544-21.000.

St. Joe Minerals Corporation: *See—*
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.

Saito, Kiyoto, to Tokyo Shibaura Electric Co., Ltd. Tomographing device. 4,200,799, Cl. 250-445.00T.

Saito, Mitsuo: *See—*
Anahara, Ryoji; Sato, Koichi; Kaneda, Motoshiro; and Saito, Mitsuo, 4,200,835, Cl. 324-51.000.

Saito, Toshihisa: *See—*
Ishiguro, Yasuo; Wakazono, Kenji; and Saito, Toshihisa, 4,200,375, Cl. 354-50.000.

Sakai, Yuji: *See—*
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Sakakibara, Naoji, to Aisin Seiki Kabushiki Kaisha. Electronic rotation speed control system for engines. 4,200,068, Cl. 123-102.000.

Sakamoto, Koji; Tatsumi, Susumu; and Imai, Chikara, to Ricoh Company, Ltd. Electrostatographic apparatus comprising document density sensing means. 4,200,391, Cl. 355-14.00E.

Salzman, Gary C.; and Skogen Hagenson, Mary J., to United States of America, Energy. Parabolic cell analyzer. 4,200,802, Cl. 250-461.00B.

Sanada, Noriaki: *See—*
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.

Sandoz Ltd.: *See—*
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,200,564, Cl. 260-29.40R.

Sandusky, Randall L.: *See—*
Mendenhall, Charles E.; and Sandusky, Randall L., 4,200,845, Cl. 331-1.00A.

Sanki Engineering Ltd.: *See—*
Okochi, Kazuo; and Kiyokawa, Hiroyuki, 4,200,434, Cl. 23-230.00B.

Sano, Takezo; and Murase, Ichiki, to Sumitomo Chemical Company, Limited. Cellulosic ion exchange fibers and method for preparing same. 4,200,735, Cl. 536-30.000.

Santilli, Alexander J. Lighting standard support. 4,200,906, Cl. 362-431.000.

Santora, Norman J.: *See—*
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,200,648, Cl. 424-308.000.

Sanyo Electric Co., Ltd.: *See—*
Nagata, Yoshinosuke; Kutsuyama, Hiroshi; Yamada, Makoto; and Tsukamoto, Kazuyoshi, 4,200,841, Cl. 455-169.000.

Sarkes Tarzian, Inc.: *See—*
Valdettaro, Alarico A., 4,200,850, Cl. 334-1.000.

Sasatani, Takashi: *See—*
Makisumi, Yasuo; Murabayashi, Akira; and Sasatani, Takashi, 4,200,757, Cl. 548-246.000.

Sasazawa, Koji; Komine, Shigeo; Kitamoto, Tatsuji; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Process for preparing magnetic iron oxide and magnetic iron oxide produced thereby. 4,200,680, Cl. 428-403.000.

Sata, Toshikatsu: *See—*
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,200,711, Cl. 525-387.000.

Sato, Kanemasa; Ueno, Sadayasu; and Ichikawa, Norio, to Hitachi, Ltd. Device for electrochemically measuring the concentration of oxygen in combustion gases. 4,200,511, Cl. 204-195.00S.

Sato, Koichi: *See—*
Anahara, Ryoji; Sato, Koichi; Kaneda, Motoshiro; and Saito, Mitsuo, 4,200,835, Cl. 324-51.000.

Sato, Mikio; and Magami, Kozo, to Alps Electric Co., Ltd. Variable resistor. 4,200,857, Cl. 338-174.000.

Sato, Yasuhisa; Tsuji, Sadahiko; Ishikawa, Kazuo; and Matsumura, Susumu, to Canon Kabushiki Kaisha. Camera provided with means for giving information about photographing. 4,200,380, Cl. 354-219.000.

Sato, Yasuhisa: *See—*
Tsuji, Sadahiko; and Sato, Yasuhisa, 4,200,358, Cl. 350-184.000.

Sato, Yoshihiko; and Kubota, Masayuki, to Hitachi, Ltd. Driving mechanism for driving moving handrail. 4,200,177, Cl. 198-335.000.

Sauerland, Franz L. Apparatus for automatic lapping control. 4,199,902, Cl. 51-165.00R.

Sautter, Wilfried: *See—*
Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, 4,200,076, Cl. 123-140.0CC.

Sava, Cornel D.: *See—*
Teodorescu, Constantin; Chiriac, Ilie; Sava, Cornel D.; Draghici, Adrian; and Zinca, Sabin, 4,200,425, Cl. 417-178.000.

Savov, Peter H.; Peev, Vassil G.; Valchev, Alexander Y.; and Lingorski, Nikola A., to DSO "Cherna Metalurgia". Method for the refining of iron-based melts. 4,200,452, Cl. 75-12.000.

Sawitzki, Martin: *See—*
Sterk, Zvonimir; Sawitzki, Martin; and Grimm, Heinz, 4,200,061, Cl. 122-32.000.

Scandinavian Lancers Aktiebolag: *See—*
Oberg, Karl-Erik; and Bertheussen, Harry, 4,200,458, Cl. 75-129.000.

Scapa Canada Ltee: *See—*
O'Hagan, Peter K., 4,200,490, Cl. 162-200.000.

Scarlett, John: *See—*
Bailey, Edgar E.; Nicholson, Norman E.; Scarlett, John; and Flintoff, John F., 4,200,619, Cl. 423-242.000.

Schaal, Gerd E.: *See—*
Honmann, Winfried; and Schaal, Gerd E., 4,200,441, Cl. 55-181.000.

Schaale, Robert G., to Allis-Chalmers Corporation. Method and apparatus for the aligning and installation of wicket gate bushings in a unitized stay ring-discharge ring of a hydro-turbine machine. 4,200,514, Cl. 264-262.000.

Schaefer, Robert J.; and Ayers, Jack D., to United States of America, Navy. Laser spraying. 4,200,669, Cl. 427-53.100.

Schaeffer, Jack A.: *See—*
Bowman, Miles A., Jr.; and Schaeffer, Jack A., 4,200,165, Cl. 180-253.000.

Schafer, Wilbur C.: *See—*
Hakanson, Alton L.; and Schafer, Wilbur C., 4,199,950, Cl. 60-605.000.

Scharf, Helmut, to Chemische Werke Huls A.G. Process for preparing acetone from isobutyraldehyde. 4,200,589, Cl. 260-593.00R.

Scheibitz, Wolfgang: *See—*
Ehlers, Klaus-Peter; Scheibitz, Wolfgang; Schrodter, Klaus; and Heymer, Gero, 4,200,620, Cl. 423-321.00S.

Schenck, Hans-Uwe: *See—*
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Schering Aktiengesellschaft: *See—*
Guenzel, Peter; Rosskamp, Guenter; Kolberg, Reiner; and Porep, Hans-Juergen, 4,200,099, Cl. 128-266.000.

Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, to Compagnie Francaise de Raffinage; and Universal Matthey Products S.A. Process and apparatus for desalting crude petroleum. 4,200,550, Cl. 252-335.000.

Schiess, Jorg: *See—*
Carnt, Peter S.; Rutishauser, Ernst A. O.; and Schiess, Jorg, 4,200,881, Cl. 358-4.000.
Schmidle, Claude J., to Thiokol Corporation. Actinic radiation curable polymers. 4,200,762, Cl. 560-26.000.
Schmidt, Donald K.; and Kuhn, Patrick, to Clark Equipment Company. Foldable boom assembly. 4,200,255, Cl. 248-289.00A.
Schmidt, Gerhard: *See—*
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.
Schmidt, Gunter: *See—*
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Schmidt, Hans-Dieter: *See—*
Petersen, Otto; and Schmidt, Hans-Dieter, 4,200,512, Cl. 204-195.00R.
Schmidt, Manfred: *See—*
Riegler, Ernst; and Schmidt, Manfred, 4,200,210, Cl. 222-598.000.
Riegler, Ernst; and Schmidt, Manfred, 4,200,266, Cl. 266-236.000.
Schmidt, Otto K., to AMF Incorporated. Lipid removal from tobacco. 4,200,113, Cl. 131-17.000.
Schmidt, Paul H.: *See—*
Joy, David C.; and Schmidt, Paul H., 4,200,555, Cl. 252-521.000.
Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Carbonless duplicating systems. 4,200,313, Cl. 282-27.500.
Schmitt, Ernst: *See—*
Neuendorf, Manfred; Schmitt, Ernst; and Schubert, Gustav, 4,200,798, Cl. 250-439.00P.
Schneider, Bruno; Nigg, Fritz; and Risse, Jean-Claude, to J. Bobst & Fils, S.A. Conveyor device for a thin web and a method of conveying. 4,200,246, Cl. 242-67.400.
Schneider, Joseph D.: *See—*
Johansson, August V.; and Schneider, Joseph D., 4,200,832, Cl. 322-59.000.
Schneider, Siegfried: *See—*
Kyri, Hans; Lauss, Hans-Dietrich; and Schneider, Siegfried, 4,200,622, Cl. 423-471.000.
Schneider, Walter: *See—*
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.
Schnur, Rodney C., to Pfizer Inc. Spiro-oxazolidindiones. 4,200,642, Cl. 424-272.000.
Scholl, Charles H.: *See—*
Akers, Larry D.; and Scholl, Charles H., 4,200,207, Cl. 222-190.000.
Scholz, Julian W. Nut cracker. 4,200,042, Cl. 99-582.000.
Schoneberger, Edgar F.: *See—*
Schramm, Peter; Schuhmann, Siegfried; Schoneberger, Edgar F.; Dorn, Alfred; and Cappel, Bert, 4,200,932, Cl. 364-519.000.
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Schreiner, Felix: *See—*
Petrick, Michael; Pierson, Edward S.; and Schreiner, Felix, 4,200,815, Cl. 310-11.000.
Schrock, Steven L.; and Mangus, James D., to Westinghouse Electric Corp. Method and apparatus for locating a defective tube of a liquid metal-to-water tube type heat exchanger. 4,199,975, Cl. 73-40.700.
Schroder, Rolf: *See—*
Maurer, Fritz; Schroder, Rolf; and Hammann, Ingeborg, 4,200,637, Cl. 424-251.000.
Schrodter, Klaus: *See—*
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Schroeder, Karl; and Pappas, James A., to Schroeder, Karl. Beverage delivery system. 4,200,202, Cl. 221-150.00R.
Schubert, Gustav: *See—*
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Schuhmann, Siegfried: *See—*
Schramm, Peter; Schuhmann, Siegfried; Schoneberger, Edgar F.; Dorn, Alfred; and Cappel, Bert, 4,200,932, Cl. 364-519.000.
Schulde, Felix: *See—*
Peterlein, Karl; Schulde, Felix; Diedrich, Klaus M.; and Kulisch, Volker W., 4,200,559, Cl. 260-17.4ST.
Schulz, Alfred: *See—*
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Schummer, Anton: *See—*
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Schuresko, Daniel D., to United States of America, Energy. Portable spotter for fluorescent contaminants on surfaces. 4,200,801, Cl. 250-458.000.
Schwarz, Wolfgang: *See—*
Denzinger, Walter; Schenck, Hans-Uwe; and Schwarz, Wolfgang, 4,200,710, Cl. 525-356.000.
Schwenker, Robert F., Jr.: *See—*
Chatterjee, Pronoy K.; and Schwenker, Robert F., Jr., 4,200,557, Cl. 260-17.00A.
Scibelli, Gabriele E., to Stauffer Chemical Company. Fortification of soft drinks with protein. 4,200,662, Cl. 426-583.000.
Scott, H. Edwin. Load retaining device for silage truck. 4,200,330, Cl. 296-100.000.
Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, The: *See—*
Cunningham, Sinclair U.; Firth, Donald; and Jackson, Douglas, 4,200,052, Cl. 114-230.000.
Sederquist, Richard A., to United Technologies Corporation. Integrated fuel cell and fuel conversion apparatus. 4,200,682, Cl. 429-17.000.
Sedlak, Michael, to Mobil Oil Corporation. Grease composition. 4,200,542, Cl. 252-25.000.
Seeley, Elwin W., to United States of America, Navy. Folded tapered coaxial cavity-backed annular slot antenna. 4,200,873, Cl. 343-710.000.
Seeley, Richard B.: *See—*
Seeley, Robert D.; and Seeley, Richard B., 4,200,663, Cl. 426-614.000.
Seeley, Robert D.; and Seeley, Richard B., to S. & R. Food Co., Inc. Cholesterol-free egg product having improved cooking tolerance. 4,200,663, Cl. 426-614.000.
Segal, Paul D.; and Wong, Ching-Ping, to Western Electric Company, Inc. Method of repairing a defective photomask. 4,200,668, Cl. 427-53.100.
Seguine, Edward S., to Procter & Gamble Company, The. Method for dewaxing refined vegetable oils for refrigerator clarity stability. 4,200,509, Cl. 204-186.000.
Seidl, Franz: *See—*
Das Gupta, Arun-Kumar; and Seidl, Franz, 4,200,273, Cl. 269-61.000.
Seiko Kagaku Kogyo Co., Ltd.: *See—*
Yoshioka, Shigehiko; and Okada, Kaoru, 4,200,562, Cl. 260-29.6RW.
Seipp, William H., to Gulf & Western Industries, Inc. Programmable controller using microprocessor. 4,200,916, Cl. 364-900.000.
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, to Toyo Soda Manufacturing Co. Ltd. Process for preparing cation-exchange membrane. 4,200,538, Cl. 210-500.00M.
Seki, Mitsuaki: *See—*
Nozaki, Mineo; Asakura, Osamu; and Seki, Mitsuaki, 4,200,043, Cl. 101-93.290.
Seki, Norio: *See—*
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Imamura, Tetuo; Yasuhara, Minoru; and Teramae, Masaru, 4,200,605, Cl. 264-145.000.
Sekiwa, Mitsunao, to Matsushita Electric Industrial Co., Ltd. Circuit board wire trimming apparatus. 4,200,018, Cl. 83-425.000.
Selvin, Gerald J.: *See—*
Anhalt, John W.; Goodman, David S.; and Selvin, Gerald J., 4,200,768, Cl. 174-79.000.
Seymour, Merritt W.; Wyerman, Barry R.; and Steffy, Gary R., to Owens-Corning Fiberglas Corporation. End cap and suspension means for acoustical ceiling baffle. 4,200,171, Cl. 181-287.000.
Shackle, Dale R.: *See—*
Lee, Yu-Sun; and Shackle, Dale R., 4,200,667, Cl. 427-44.000.
Shaffer, John W.; Bricker, Daniel W.; and Audesse, Emery G., to GTE Sylvania Incorporated. Multilamp photoflash unit with electrostatic protection. 4,200,901, Cl. 362-5.000.
Shelby, Billy L.; and Moore, William C., to International Telephone and Telegraph Corporation. Detachable hinge mechanism for luminaire. 4,200,905, Cl. 362-396.000.
Shell Oil Company: *See—*
Kwant, Pieter B.; Kanbier, Dirk; Tjan, Petrus W. H. L.; and Akbar, Mohammed, 4,200,519, Cl. 208-77.000.
Meijs, Franciscus H., 4,199,858, Cl. 29-458.000.
Sheng, Ming N.: *See—*
Pedersen, Svend E.; and Sheng, Ming N., 4,200,584, Cl. 260-346.750.
Shenk, Edwin K., to Polaroid Corporation. Automatic focusing camera with lens jam sensor control. 4,200,378, Cl. 354-195.000.
Sheppard, Kalin I.: *See—*
Simone, James V.; and Sheppard, Kalin I., 4,200,239, Cl. 241-36.000.
Sherif, Sherif A.; and Hachtmann, James E., to Magnesium Elektron Inc. Stable copper zirconium complex salt solutions for enhancing the resistance to rot of cotton fabrics. 4,200,672, Cl. 427-226.000.
Sherlock, Thomas P.: *See—*
Albaric, Jacques E.; Coyle, Forrest E.; and Sherlock, Thomas P., 4,200,784, Cl. 219-470.000.
Sherwood, Edward F., to Westinghouse Electric Corp. Illuminated sign and lamp box assembly. 4,199,885, Cl. 40-568.000.
Shilling, Jack W.: *See—*
Datta, Amitava; Miller, Clarence L., Jr.; and Shilling, Jack W., 4,200,477, Cl. 148-113.000.
Shimano Industrial Company Limited: *See—*
Isobe, Mitsuhide, 4,199,997, Cl. 74-217.00B.
Isobe, Mitsuhide, 4,199,998, Cl. 74-217.00B.
Shimizu, Akihiko: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,200,538, Cl. 210-500.00M.
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Cameras having a coordinated energy supply system for shutter release. 4,200,374, Cl. 354-60.00R.

Shindo, Minoru: *See*—
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Shinkai, Hiroyuki: *See*—
Mochida, Ei; Ogawa, Nobuhisa; Shinkai, Hiroyuki; and Hashimoto, Masakatsu, 4,200,436, Cl. 23-230.00B.

Shinohara, Makoto; and Field, Nathan D., to International Playtex, Inc. Preparation of water-insoluble carboxymethyl cellulose absorbents. 4,200,736, Cl. 536-87.000.

Shinohara, Makoto: *See*—
Marder, Herman L.; Field, Nathan D.; and Shinohara, Makoto, 4,200,737, Cl. 536-87.000.

Shionogi & Co., Ltd.: *See*—
Igarashi, Kikuo; Irisawa, Junji; and Honma, Tsunetoshi, 4,200,628, Cl. 424-180.000.
Makisumi, Yasuo; Murabayashi, Akira; and Sasatani, Takashi, 4,200,757, Cl. 548-246.000.

Shishido, Tadao; and Arai, Naoki, to Fuji Photo Film Co., Ltd. Silver halide color photographic materials containing a UV filter compound. 4,200,464, Cl. 430-512.000.

Shishoo, Roshan L., to Tex Innovation AB. Method of treating fibrous materials. 4,199,916, Cl. 53-434.000.

Shivashankara, Belur N.: *See*—
Cowan, Samuel J.; Gerend, Robert P.; Ramsay, James W.; and Shivashankara, Belur N., 4,199,936, Cl. 60-226.00R.

Shono, Tetsuji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Lens shutter use and non-use switching device of an interchangeable lens having a lens shutter for use with a focal plane single lens reflex camera. 4,200,385, Cl. 354-233.000.

Shoup, Gary L.; and Grier, Jack B., to Carborundum Company, The. Retractable blast wheel carrier. 4,199,904, Cl. 51-423.000.

Shreeves, Ernest F.: *See*—
Listle, Kenneth N.; and Shreeves, Ernest F., 4,200,034, Cl. 98-40.00C.

Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Use of crystalline pure or substantially pure 2,4,6-tri-isobutyl-1,3,5-dithiazine and process for preparing same. 4,200,741, Cl. 544-5.000.

Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Crystalline pure 2,4,6-tri-isobutyl dihydro-1,3,5-dithiazine. 4,200,742, Cl. 544-5.000.

Siarto, Andrew V., to Siarto Machine & Tool Co., Inc. Method of machining. 4,200,182, Cl. 198-617.000.

Siarto Machine & Tool Co., Inc.: *See*—
Siarto, Andrew V., 4,200,182, Cl. 198-617.000.

Sick, Erwin; Hartmann, Klaus; and Henneberger, Heinz, to Erwin Sick GmbH Optik-Elektronik. Apparatus for distinguishing between predetermined ranges of angles at which light rays leave a surface. 4,200,397, Cl. 356-429.000.

Siegel, Dale, to Hydra-Troll, Inc. Trolling driving means for boat. 4,200,055, Cl. 115-18.00A.

Siemens Aktiengesellschaft: *See*—
Ganslmeier, Michael; and Wuenschmann, Horst, 4,199,986, Cl. 73-362.0AR.
Gedeon, Andras; Olsson, Sven-Gunnar; and Psaros, Georgios, 4,200,094, Cl. 128-201.130.
Glock, Hans; and Hartel, Gerhard, 4,200,918, Cl. 365-210.000.
Heinzl, Joachim, 4,200,769, Cl. 178-30.000.
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,200,848, Cl. 333-165.000.
Munz, Wolf-Dieter; Bock, Siegfried; and Potzlberger, Hans W., 4,200,502, Cl. 204-15.000.
Neuendorf, Manfred; Schmitt, Ernst; and Schubert, Gustav, 4,200,798, Cl. 250-439.00P.
Weigert, Kurt, 4,200,108, Cl. 128-419.00R.

Siempelkamp Giesserei GmbH & Co.: *See*—
Beine, Burkhard; Ostendorf, Hermann; and Schmidt, Gunter, 4,199,994, Cl. 73-785.000.

Sifferlen, Thomas P.; and Steudel, Fritz, to United States of America, Air Force. Doppler compensated digital non-linear waveform generator apparatus. 4,200,872, Cl. 343-7.500.

Siffert, Bernard: *See*—
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.

Silberman, Ira J.: *See*—
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Silverman, Jacob: *See*—
Friefeld, Jerome M.; and Silverman, Jacob, 4,200,148, Cl. 165-104.00S.

Simone, James V.; and Sheppard, Kalin I., to Wright Line Inc. Machine that quadrates documents. 4,200,239, Cl. 241-36.000.

Simonsson, Sven B., to Aktiebolaget Electrolux. Indicating device for vacuum cleaners. 4,199,838, Cl. 15-339.000.

Sinclair, William Y.; and Argila, Joseph, to Aries Electronics, Inc. Socket for vertically mounting multi-pin device. 4,200,347, Cl. 339-17.0CF.

Singer Company, The: *See*—
Barbarasch, Joseph, 4,199,875, Cl. 35-12.00N.
Houseknecht, Keith J., 4,200,368, Cl. 353-88.000.

Singer, Irwin: *See*—
Cox, Malcolm; and Singer, Irwin, 4,200,630, Cl. 424-227.000.

Singer, Malcolm S., to Chevron Research Company. N-Alkyl or alkoxy-N'-substituted hydrocarbyl urea. 4,200,450, Cl. 71-106.000.

Singer, Norman S.: *See*—
Ladbrooke, Brian D.; Quick, Gary R.; and Singer, Norman S., 4,200,569, Cl. 260-112.00G.

Singleton, Leonard, Jr.: *See*—
Muehlenbrock, Dale R.; Prihoda, John R.; and Singleton, Leonard, Jr., 4,200,734, Cl. 528-503.000.

Sinner, Michael: *See*—
Puls, Jurgen; Sinner, Michael; and Dietrichs, Hans-Hermann, 4,200,692, Cl. 435-99.000.

Sirovich, Bruce E., to Standard Oil Company (Indiana). Hydride heat pump. 4,200,144, Cl. 165-1.000.

Sitkins, Fred Z.; and Hill, David A. Carton opening device. 4,199,833, Cl. 7-166.000.

Skogen Hagenson, Mary J.: *See*—
Salzman, Gary C.; and Skogen Hagenson, Mary J., 4,200,802, Cl. 250-461.00B.

Skover, Nick, Jr., to Applied Power Inc. Locking cylinders. 4,200,031, Cl. 91-420.000.

Skuditsky, Mark S.: *See*—
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Slegers, Maurice: *See*—
Muchow, John D.; Jones, Graham J.; and Slegers, Maurice, 4,199,834, Cl. 15-104.06A.

Slimp, Jack B., Jr. Tiltable board game apparatus. 4,200,292, Cl. 273-258.000.

Slinkard, William E.; Baylis, Anthony B.; and Hughes, Michael P., to Celanese Corporation. Oxidation of aliphatic hydrocarbons with high strength hydrocarbon oxidation catalyst. 4,200,764, Cl. 562-549.000.

Small, Robert E.: *See*—
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,200,041, Cl. 99-483.000.

Smilgys, Bruno S.: *See*—
Evans, Alfred C.; and Smilgys, Bruno S., 4,200,785, Cl. 235-92.0FL.

Smith, Darrell F., Jr.; Tipton, David G.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., to Huntington Alloys, Inc. Heat resistant low expansion alloy. 4,200,459, Cl. 75-170.000.

Smith, Donald L.: *See*—
Kuhar, Eugene; and Smith, Donald L., 4,200,913, Cl. 364-900.000.

Smith, Edward H.: *See*—
Gerkey, Kenneth S.; and Smith, Edward H., 4,200,424, Cl. 414-744.000.

Smith, Harry: *See*—
Buckle, Derek R.; and Smith, Harry, 4,200,577, Cl. 424-281.000.

Smith, Harry D., Jr.: *See*—
Arnold, Dan M.; and Smith, Harry D., Jr., 4,200,789, Cl. 250-270.000.

Smith, Harry E.: *See*—
Ruffing, Charles R.; Gause, Smith A.; Botts, John C.; and Smith, Harry E., 4,200,818, Cl. 310-214.000.

Smith, Henry I.; Austin, Stewart S.; and Flanders, Dale C., to Massachusetts Institute of Technology. Alignment of diffraction gratings. 4,200,395, Cl. 356-356.000.

Smith International, Inc.: *See*—
Newcomb, Alan L., 4,200,160, Cl. 175-340.000.

Smith, Leslie H.: *See*—
Large, Michael S.; and Smith, Leslie H., 4,200,652, Cl. 424-321.000.

Smith, Raymond A. Retrieving device. 4,200,322, Cl. 294-19.00R.

SmithKline Corporation: *See*—
Gleason, John G.; Holden, Kenneth G.; and Huffman, William F., 4,200,572, Cl. 260-239.00A.
Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, 4,200,738, Cl. 536-121.000.
Holden, Kenneth G.; and Perchonock, Carl D., 4,200,754, Cl. 546-150.000.

Smollinger, Glenn J.: *See*—
Oughton, George W.; and Smollinger, Glenn J., 4,200,830, Cl. 320-32.000.

Sneed, John, Jr. Wood turning tool. 4,200,129, Cl. 142-56.000.

Sobolewski, Robert: *See*—
Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., 4,200,137, Cl. 164-49.000.

Societe Anonyme DBA: *See*—
Courbot, Pierre, 4,200,176, Cl. 192-89.00B.

Societe CECA S.A.: *See*—
Brigand, Gerard; Kragen, Horst; and Rizzotti, Robert, 4,200,661, Cl. 426-573.000.

Societe de Vente de l'Aluminium Pechiney: *See*—
Dubost, Bruno; and Bouvaist, Jean, 4,200,476, Cl. 148-12.70A.

Societe Nationale Industrielle Aerospatiale: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,200,935, Cl. 364-717.000.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Fluehmann, Werner, 4,200,000, Cl. 74-437.000.

Soderstrom, Sven-Erik: *See*—
Persson, Anders; and Soderstrom, Sven-Erik, 4,200,398, Cl. 356-437.000.

Soejima, Shigeo: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, 4,200,552, Cl. 252-466.0PT.

Sommers, Earl F.: *See—*
Fraley, Jack E.; Sommers, Earl F.; Strang, Shorter; and McConnell, W. C., 4,200,232, Cl. 239-112.000.

Sontheimer, Carl G. Readily installed food processor cutter tool with negative blade lift. 4,200,244, Cl. 241-282.100.

Sony Corporation: *See—*
Nagumo, Fumio, 4,200,884, Cl. 358-11.000.
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,200,883, Cl. 358-44.000.

Sorli, Duncan C.: *See—*
Josephson, Donald G.; and Sorli, Duncan C., 4,200,384, Cl. 354-304.000.

Sornsin, Earl W. Storable boom attachment for a construction machine. 4,200,423, Cl. 414-724.000.

Spaida, Hans-Peter: *See—*
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.

Specht, Theodore R.: *See—*
DeLaurentis, Angelo A.; Zola, Frank G., Jr.; and Specht, Theodore R., 4,200,854, Cl. 336-217.000.

Spector, Donald. Aroma-dispensing cartridge and holder assembly. 4,200,229, Cl. 239-57.000.

Sperry Corporation: *See—*
Roeder, Robert S.; and Bomar, Lucien C., II, 4,200,871, Cl. 343-7.400.

Sperry Rand Corporation: *See—*
Allan, Iain D.; and Walberg, Per-Erik, 4,200,928, Cl. 364-200.000.
Mendenhall, Charles E.; and Sandusky, Randall L., 4,200,845, Cl. 331-1.00A.

Sperry-Sun, Inc.: *See—*
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Spitz, Joseph J.: *See—*
Hein, Carl C., III; and Spitz, Joseph J., 4,200,200, Cl. 221-48.000.

Spong, Henry K.: *See—*
Swaine, Derwent; Spong, Henry K.; and Lewin, Brian M., 4,200,610, Cl. 422-239.000.

Sponseller, Trent A.: *See—*
Massey, Fred L.; and Sponseller, Trent A., 4,200,731, Cl. 525-437.000.

Stahl, Philip; Moskowitz, Ronald; and Reed, Walter R., to Ferrofluidics Corporation. Ferrofluid centrifugal seal. 4,200,296, Cl. 277-80.000.

Stamicarbon, B.V.: *See—*
Pennings, Albertus J.; and Vossebeld, Arnold, 4,200,579, Cl. 260-33.6AQ.
Pennings, Albertus J.; and Vossebeld, Arnold, 4,200,722, Cl. 526-282.000.
van der Loos, Jozef L. M.; and Duijzings, Wilhelmus G., 4,200,593, Cl. 525-243.000.

Standard Oil Company (Indiana): *See—*
Mahoney, John A.; and Frye, Clifton G., 4,200,714, Cl. 526-68.000.
Sirovich, Bruce E., 4,200,144, Cl. 165-1.000.

Stanford University: *See—*
Hellman, Martin E.; Diffie, Bailey W.; and Merkle, Ralph C., 4,200,770, Cl. 178-22.000.

Stanley, Priscilla B.; and Anderson, Donald F., to Union Carbide Corporation. Controlled degradation of poly(ethylene oxide). 4,200,704, Cl. 525-409.000.

Stark, Eugene E., Jr.; Kephart, John F.; Leland, Wallace T.; and Reichelt, Walter H., to United States of America, Energy. Efficient laser amplifier using sequential pulses of different wavelengths. 4,200,846, Cl. 331-94.50R.

Starks, Charles M., to Conoco, Inc. Curing of phenol-formaldehyde resins. 4,200,706, Cl. 525-502.000.

State of Connecticut: *See—*
Carney, John F., III, 4,200,310, Cl. 280-784.000.

Stauffer Chemical Company: *See—*
Scibelli, Gabriele E., 4,200,662, Cl. 426-583.000.

Stauter, John C.: *See—*
Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., 4,200,455, Cl. 75-91.000.

Stebegg, Josef: *See—*
Fischer, Karl; and Stebegg, Josef, 4,200,250, Cl. 242-199.000.

Steckler, Steven A.: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,200,811, Cl. 307-225.00R.

Steele, James R., to Dynamic Air Incorporated. Control for pneumatic conveying system. 4,200,412, Cl. 406-22.000.

Steele, Wallace A., to Lilly Company, The. Method of forming fire retardant printed wood paneling. 4,200,673, Cl. 427-264.000.

Steffy, Gary R.: *See—*
Seymour, Merritt W.; Wyerman, Barry R.; and Steffy, Gary R., 4,200,171, Cl. 181-287.000.

Stein, Eckehard, to Hoechst Aktiengesellschaft. Vaporizer for generating developer gas, containing ammonia gas, from aqueous ammonia for developing diazo copying material. 4,200,496, Cl. 202-153.000.

Stein Industrie: *See—*
Marjollet, Jacques; Tondeur, Gerard; Cerdan, Jean-Pierre; and Talleu, Patrick, 4,200,443, Cl. 55-347.000.

Stein, Robert G.; Couch, Terry L.; and Michaels, Raymond J., to Abbott Laboratories. Ovicides. 4,200,654, Cl. 424-330.000.

Stein, Thomas R.; Heck, Roland H.; and Dabkowski, Michael J., to Electric Power Research Institute, Inc. Catalytic hydroprocessing of solvent refined coal to provide a liquid and a solid fuel. 4,200,521, Cl. 208-216.0PP.

Steinberg, Marvin P.: *See—*
Day, Donald L.; and Steinberg, Marvin P., 4,200,505, Cl. 204-149.000.

Steinbock GmbH: *See—*
Hansen, Rudolf, 4,200,166, Cl. 180-77.00R.

Steiner, Russell I., to Crompton & Knowles Corporation. 5-Halo-2-trifluoromethylphenylazo-pyrazolones. 4,200,570, Cl. 260-163.000.

Steinke, Leo: *See—*
Kauhl, Gunther; Pflug, Hannes; and Steinke, Leo, 4,200,077, Cl. 123-145.00A.

Stephan, Rudolf: *See—*
Gausepohl, Hermann; Naarmann, Herbert; Penzien, Klaus; and Stephan, Rudolf, 4,200,702, Cl. 525-72.000.

Stephens, Eugene A.: *See—*
Hobbs, Thomas G., Jr.; and Stephens, Eugene A., 4,200,097, Cl. 128-251.000.

Stephens, Frank A.: *See—*
Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., 4,200,455, Cl. 75-91.000.

Sterk, Zvonimir; Sawitzki, Martin; and Grimm, Heinz, to Kraftwerk Union Aktiengesellschaft. Steam generator for nuclear power plants, especially for pressurized water reactors. 4,200,061, Cl. 122-32.000.

Sterling Drug Inc.: *See—*
Farah, Alfred E.; and Gorman, William G., 4,200,655, Cl. 424-343.000.
Schmidt, Paul J.; and Hung, William M., 4,200,313, Cl. 282-27.500.

Steudel, Fritz: *See—*
Sifferlen, Thomas P.; and Steudel, Fritz, 4,200,872, Cl. 343-7.500.

Steward, R. James. Amusement device for tracing geometrical figures. 4,199,868, Cl. 33-27.00L.

Stinchfield, George V.: *See—*
Babler, Richard G.; Stinchfield, George V.; and Kannard, Melvin W., 4,200,408, Cl. 404-83.000.

Stodt, Eberhard, to Lindemann Maschinenfabrik GmbH. Closures of bunkers for holding refuse. 4,200,422, Cl. 414-304.000.

Stoll, Max: *See—*
Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,200,660, Cl. 426-535.000.

Stoltman, Donald D., to General Motors Corporation. Electronic throttle body fuel injection system. 4,200,073, Cl. 123-139.0AW.

Stone, Stanley E.: *See—*
Hughes, Jeffrey F.; Liptay, John S.; Rymarczyk, James W.; and Stone, Stanley E., 4,200,927, Cl. 364-200.000.

Stoner, Glenn E.: *See—*
Wilkins, Judd R.; and Stoner, Glenn E., 4,200,493, Cl. 435-291.000.

Stotz, Manfred: *See—*
Hilpert, Wolfgang; Komander, Gerhard; and Stotz, Manfred, 4,199,977, Cl. 73-119.00A.

Strang, Shorter: *See—*
Fraley, Jack E.; Sommers, Earl F.; Strang, Shorter; and McConnell, W. C., 4,200,232, Cl. 239-112.000.

Strathman, Lyle R., to Rockwell International Corporation. Stroke written shadow-mask multi-color CRT display system. 4,200,866, Cl. 340-703.000.

Stratynski, Eugene; and Zukausky, Keith, to Eaton Corporation. Valve assembly. 4,200,124, Cl. 137-885.000.

Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, to Robert Bosch GmbH. Fuel control device for supercharged diesel engines. 4,200,076, Cl. 123-140.0CC.

Streathern Audio Limited: *See—*
Ridler, Keith D.; and Plummer, Dexter R., 4,200,828, Cl. 318-558.000.

Striffeler, Werner, to Micafil, AG. Compound and process for sealing spaces in electrical instruments. 4,200,698, Cl. 521-120.000.

Stritzinger, Heinz: *See—*
Pister, Philipp; Buettner, Franz; Hammon, Fritz; Ohlinger, Manfred; Stritzinger, Heinz; Hartmann, Job-Werner; and Schneider, Walter, 4,200,678, Cl. 428-329.000.

Strobele, Caljon H., to BASF Aktiengesellschaft. Complementary pre-emphasis and de-emphasis circuits for a video signal transfer channel. 4,200,889, Cl. 358-167.000.

Stroupe, Stephen D.; and Moore, Edwin G., to Abbott Laboratories. Determination of glycosylated hemoglobin in blood. 4,200,435, Cl. 23-230.00B.

Struger, Odo J.; Grants, Valdis; and Grudowski, Raymond A., to Allen-Bradley Company. Program loader for programmable controller. 4,200,915, Cl. 364-900.000.

Stubenrauch, Gerd: *See—*
Linhart, Friedrich; Stubenrauch, Gerd; and Hamprecht, Gerhard, 4,200,743, Cl. 544-11.000.

Stumpp, Gerhard: *See—*
Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, 4,200,076, Cl. 123-140.0CC.

Stupay, Lawrence J., to Bunker Ramo Corporation. Medical clip. 4,200,348, Cl. 339-61.00R.

Sturtz, Georges; and Clement, Jean-Claude. 3-(1,6-)Diaminohexyldiloweralkyl) Phosphonates. 4,200,594, Cl. 260-944.000.

Stutsman, Richard R.: *See—*
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,200,201, Cl. 221-129.000.

Suchy, Milos, to Hoffmann-La Roche Inc. 2-[P-(p-Substituted phenoxy)phenoxy]propionyl oximes. 4,200,587, Cl. 260-566.0AE.

Sugano, Shigeru: *See*—
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Sugimoto, Hiroshi: *See*—
Ishii, Shigetaka; Kiho, Keiichi; Sugiyama, Shinichi; and Sugimoto, Hiroshi, 4,200,694, Cl. 435-101.000.

Sugimoto, Toshiyuki: *See*—
Yokobayashi, Koji; and Sugimoto, Toshiyuki, 4,200,693, Cl. 435-101.000.

Sugiyama, Shinichi: *See*—
Ishii, Shigetaka; Kiho, Keiichi; Sugiyama, Shinichi; and Sugimoto, Hiroshi, 4,200,694, Cl. 435-101.000.

Sulzer Brothers Limited: *See*—
Berchtold, Ernst, 4,200,066, Cl. 123-41.310.
Fricker, Hans, 4,199,853, Cl. 29-415.000.
Niederer, Peter G., 4,199,824, Cl. 3-1.913.

Sumitomo Chemical Company, Limited: *See*—
Sano, Takezo; and Murase, Ichiki, 4,200,735, Cl. 536-30.000.

Summa Corporation: *See*—
Larsen, Morrie E.; and Hackstaff, Alain, 4,200,837, Cl. 455-92.000.
Logan, Andrew H.; and Moore, Richard E., 4,200,252, Cl. 244-17.190.

Sun-Econ, Inc.: *See*—
Jonsson, Kjartan A., 4,199,955, Cl. 62-79.000.

Sunahara, Toshitaka: *See*—
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Sunden, Olof; Johansson, Hans; Ahlberg, Hakan B.; and Karlsson, Per-Arne I., to Elektrokemiska Aktiebolaget. Silicic acid detergent product for microdeposition of silicic acid on textiles. 4,200,548, Cl. 252-135.000.

Sutton, Blaine M.: *See*—
Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, 4,200,738, Cl. 536-121.000.

Suzuki, Etsuji; Yasue, Itaru; and Kashihama, Tomio, to Tokyo Shibaura Elecric Co., Ltd. Method of positioning a semiconductor member by examining it and a die bonding apparatus using the same. 4,200,393, Cl. 356-73.000.

Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru. Method for controlling the toner concentration of a developer used in a dry type developing system. 4,200,665, Cl. 430-30.000.

Suzuki, Minoru: *See*—
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,200,665, Cl. 430-30.000.

Suzuki, Nobuyoshi, to Olympus Opitcal Co., Ltd. Automatic chemical analyzer. 4,200,607, Cl. 422-64.000.

Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, to Canon Kabushiki Kaisha. Photographic camera with film speed setting system. 4,200,371, Cl. 354-21.000.

Suzuki, Ryoshu: *See*—
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,200,726, Cl. 528-99.000.

Suzuki, Shigeru: *See*—
Suzuki, Koichi; Suzuki, Shigeru; and Suzuki, Minoru, 4,200,665, Cl. 430-30.000.

Suzuki, Takaya; Ura, Mitsuru; and Ogawa, Takuzo, to Hitachi, Ltd. Temperature-compensated voltage reference diode with intermediate polycrystalline layer. 4,200,877, Cl. 357-13.000.

Suzuki, Toyotosi: *See*—
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.

Svatek, Thomas A., to Polaroid Corporation. Photographic copy apparatus with cropping feature. 4,200,392, Cl. 355-45.000.

Svensson, Sven E. Device for transfer of substantially fresh air from a stationary place to a moving receiving place. 4,200,037, Cl. 98-40.00R.

Swaine, Derwent; Spong, Henry K.; and Lewin, Brian M., to Oxoid Limited. Gas-producing device. 4,200,610, Cl. 422-239.000.

Swavely, Donald F., to Polymer Corporation, The. Locking device for circumferentially oriented elements. 4,199,859, Cl. 29-526.00R.

Swenson, Roy S.: *See*—
Brandon, Ralph E.; Davis, Charles J.; Ring, Michael; and Swenson, Roy S., 4,200,488, Cl. 162-101.000.

Swift, Roderick D., to American Science & Engineering, Inc. Reduced dose CT scanning. 4,200,800, Cl. 250-445.00T.

Swingline, Inc.: *See*—
Bobren, Allan J., 4,200,214, Cl. 227-109.000.

Sybron Corporation: *See*—
Carter, William W., 4,200,834, Cl. 324-450.000.

Symons, Robert S., to Varian Associates, Inc. High power electron beam gyro device. 4,200,820, Cl. 315-4.000.

Synstelien, Floyd L.; and Ysteboe, Howard T. Storage device. 4,200,249, Cl. 242-96.000.

Systron-Donner Corporation: *See*—
Gearheart, John D.; and Jenkinson, Frederic W., 4,200,876, Cl. 346-49.000.
Nickel, Walter; and Tarczy-Hornoch, Zoltan, 4,200,933, Cl. 364-571.000.

Szabo, Laszlo, to Volkswagenwerk Aktiengesellschaft. Mount for supporting a suspension strut assembly on a vehicle body. 4,200,307, Cl. 280-668.000.

Szporny, Laszlo: *See*—
Ezer, Elemer; Szporny, Laszlo; Forgach, Lilla; Palosi, Eva; Cholnoky, Eszter; Karpati, Egon; Hajos, Gyorgy; Hortobagyi, Gyozo; and Gidai, Katalin, 4,200,631, Cl. 424-232.000.
Matolcsy, Gyorgy; Bartok nee Berencsy, Piroska; Kiss, Bela; Palosi, Eva; Karpati, Egon; and Szporny, Laszlo, 4,200,650, Cl. 424-319.000.
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, 4,200,636, Cl. 424-250.000.

Tachino, Tomio: *See*—
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,200,205, Cl. 220-20.500.

Tagashira, Satoshi; Motegi, Akira; and Ishiguro, Toshio, to Hitachi Seiko Ltd.; and Konishiriku Photo Ind., Co., Ltd. Combined copying and printing apparatus. 4,200,390, Cl. 355-14.00R.

Taguchi, Tetsuya: *See*—
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.

Tai, Masuru: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Takahashi, Haruo: *See*—
Tanaka, Shikei; Kobayashi, Tetsuji; Matsuo, Noboru; and Takahashi, Haruo, 4,200,814, Cl. 307-309.000.

Takahashi, Kenji; Kumagai, Takasuke; and Takaichi, Kazuyoshi, to Diesel Kiki Company, Ltd. Fuel injection apparatus. 4,200,075, Cl. 123-140.0FG.

Takahashi, Kenji: *See*—
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,200,538, Cl. 210-500.00M.

Takahashi, Kotei, to Nissan Motor Company, Limited. Parking brake mechanism for motor vehicle equipped with power transmission with torque converter. 4,200,002, Cl. 74-530.000.

Takahashi, Soji: *See*—
Imai, Kuninori; Takahashi, Soji; and Akeyama, Masamoto, 4,200,217, Cl. 228-161.000.

Takaichi, Kazuyoshi: *See*—
Takahashi, Kenji; Kumagai, Takasuke; and Takaichi, Kazuyoshi, 4,200,075, Cl. 123-140.0FG.

Takaku, Sakae: *See*—
Nagano, Hiroyuki; Mori, Takashi; Takaku, Sakae; Matsunaga, Isao; Kujirai, Tatsuo; Ogasawara, Toshichika; Sugano, Shigeru; and Shindo, Minoru, 4,200,640, Cl. 424-266.000.

Takakura, Isamu: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Takano, Shuntaro: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Takashima, Matsuo, to Canon Kabushiki Kaisha. Acoustic wave scanning apparatus. 4,200,858, Cl. 367-135.000.

Takeda Chemical Industries, Ltd.: *See*—
Numata, Mitsuo; and Nishimura, Tatsuo, 4,200,575, Cl. 424-246.000.

Takeda, Kenji, to Matsushita Electric Industrial Co., Ltd. Automatic record player capable of changing discs automatically. 4,200,294, Cl. 274-10.00R.

Takeuchi, Masaya; and Hendrickson, Phillip H., to Tokyo Kogaku Kikai Kabushiki Kaisha. Fluorescent ophthalmoscopic photographing apparatus. 4,200,376, Cl. 354-62.000.

Taki, Hideo: *See*—
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Takigawa, Hiroyoshi; and Yahagi, Mitsuhisa, to Bridgestone Tire Company Limited. Heavy duty pneumatic radial tire with stress mitigating rib. 4,200,134, Cl. 152-209.00R.

Takishima, Yoshiyuki: *See*—
Aizawa, Hiroshi; Uchidoi, Masanori; Nakamura, Zenzo; and Takishima, Yoshiyuki, 4,200,370, Cl. 354-33.000.

Takuma, Masataro: *See*—
Iwatani, Akitoshi; and Takuma, Masataro, 4,200,532, Cl. 210-151.000.

Talco Aluminum Company, Inc.: *See*—
Johnston, Bobby M.; and Pope, Billy C., 4,199,900, Cl. 49-404.000.

Talleu, Patrick: *See*—
Marjollet, Jacques; Tondeur, Gerard; Cerdan, Jean-Pierre; and Talleu, Patrick, 4,200,443, Cl. 55-347.000.

Talley, Richard M.: *See*—
Baker, Edward S.; and Talley, Richard M., 4,200,410, Cl. 405-182.000.

Tamura, Sadahiro: *See*—
Nishikawa, Toshio; Ito, Yoji; Ishikawa, Youhei; and Tamura, Sadahiro, 4,200,847, Cl. 333-125.000.

Tanaka, Eiichi: *See*—
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, 4,200,632, Cl. 424-230.000.

Tanaka, Shikei; Kobayashi, Tetsuji; Matsuo, Noboru; and Takahashi, Haruo, to Tokyo Shibaura Electric Co., Ltd. Multiplier with hall element. 4,200,814, Cl. 307-309.000.

Tanner, William J.: *See—*
Perkins, William A.; and Tanner, William J., 4,200,199, Cl. 220-420.000.

Tarczy-Hornoch, Zoltan: *See—*
Nickel, Walter; and Tarczy-Hornoch, Zoltan, 4,200,933, Cl. 364-571.000.

Tarumi, Noriyoshi; and Ueno, Kenji, to Konishiroku Photo Industry Co., Ltd. Temperature detecting device for image fixing apparatus of electrostatic recording apparatus. 4,199,985, Cl. 73-351.000.

Tasai, Kunihiko: *See—*
Kiyota, Kohei; Ueda, Hiroo; Kitagawa, Shunji; and Tasai, Kunihiko, 4,200,461, Cl. 430-91.000.

Tate, Jack F., to Texaco Inc. Secondary recovery process. 4,200,151, Cl. 166-271.000.

Tate, Jack F., to Texaco Inc. Composition and method for stimulating well production. 4,200,154, Cl. 166-307.000.

Tatsumi, Susumu: *See—*
Sakamoto, Koji; Tatsumi, Susumu; and Imai, Chikara, 4,200,391, Cl. 355-14.00E.

Tax, Hans. Traveling gantry. 4,200,162, Cl. 180-23.000.

Taylor, Ernest E.: *See—*
Farrow, James T.; Vanderford, William D.; and Taylor, Ernest E., 4,199,856, Cl. 29-454.000.

Taylor, Michael: *See—*
Jenkins, Alan N.; and Taylor, Michael, 4,199,823, Cl. 2-424.000.

Technigaz: *See—*
Kotcharian, Michel, 4,199,909, Cl. 52-410.000.

Teeters, Darrel L. Post base elevator. 4,199,908, Cl. 52-295.000.

Teichmann, Manfred: *See—*
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.

Teodorescu, Constantin; Chiriac, Ilie; Sava, Cornel D.; Draghici, Adrian; and Zinca, Sabin, to Institutul National Pentru Creatie Stiintifica Si Tehnica-Increst. Gas-lift device. 4,200,425, Cl. 417-178.000.

Terada, Katsuaki: *See—*
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.

Terada, Sadatugu: *See—*
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.

Teramae, Masaru: *See—*
Imamura, Tetuo; Yasuhara, Minoru; and Teramae, Masaru, 4,200,605, Cl. 264-145.000.

Terao, Kazuhiko: *See—*
Nomura, Harehiko; Koyama, Kenichi; and Terao, Kazuhiko, 4,200,767, Cl. 174-126.00S.

Terashima, Masaharu: *See—*
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.

Tex Innovation AB: *See—*
Shishoo, Roshan L., 4,199,916, Cl. 53-434.000.

Texaco Inc.: *See—*
Arnold, Dan M.; and Smith, Harry D., Jr., 4,200,789, Cl. 250-270.000.
Brown, George R.; Carroll, Joseph C.; and Dubuisson, Sidney E., 4,200,411, Cl. 405-210.000.
Richter, Albert P., Jr.; and Peelman, Harold E., 4,199,953, Cl. 62-3.000.
Saadeh, Fuad T.; and Fontaine, Marc F., 4,200,150, Cl. 166-231.000.
Tate, Jack F., 4,200,151, Cl. 166-271.000.
Tate, Jack F., 4,200,154, Cl. 166-307.000.

Texas Instruments Incorporated: *See—*
Cochran, Michael J.; and Vandierendonck, Jerry L., 4,200,926, Cl. 364-200.000.
Morris, Henry B., 4,200,474, Cl. 148-1.500.
Reinberg, Alan R., 4,200,666, Cl. 427-39.000.

Textron, Inc.: *See—*
Mardirossian, John H., 4,199,968, Cl. 72-49.000.

Tezuka, Nobuo: *See—*
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.

Thackaberry, Harold: *See—*
Kaseta, Robert; Daugherty, Lenn; Hinlein, Sigmund; Feldstein, Michael; and Thackaberry, Harold, 4,200,894, Cl. 360-106.000.

Theeuwes, Felix: *See—*
Ayer, Atul D.; and Theeuwes, Felix, 4,200,098, Cl. 128-260.000.

Thiel, Peter H., to Westinghouse Electric Corp. Apparatus mounting arrangement for avoiding harm due to seismic shocks. 4,200,256, Cl. 248-548.000.

Thies, Fred W., to United States of America, Navy. Steered time compressor beam former. 4,200,923, Cl. 367-123.000.

Thiokol Corporation: *See—*
Schmidle, Claude J., 4,200,762, Cl. 560-26.000.

Thomas, Michael D., to Ryder International Corporation. Lens case with oppositely hinged baskets. 4,200,187, Cl. 206-5.100.

Thomas, Rolf: *See—*
Laubach, Winfried; Kienbaum, Heinz; and Thomas, Rolf, 4,200,400, Cl. 366-233.000.

Thompson, David R.: *See—*
Campbell, David C.; and Thompson, David R., 4,200,862, Cl. 340-310.00A.

Thompson, James P., to United States of America, Navy. Current limiter. 4,200,898, Cl. 361-58.000.

Thomson-CSF: *See—*
Hawkes, Thaddeus; Reymond, Jean C.; and Trocellier, Roger, 4,200,356, Cl. 350-96.160.
Valdois, Michel; Levesque, Patrick; and Hartemann, Pierre, 4,199,990, Cl. 73-517.0AV.

Thone, Bernd: *See—*
Maelzer, Carl-August; Rahn, Martin; Reh, Lothar; Thone, Bernd; Vydra, Karel; and Rice, David, 4,200,454, Cl. 75-88.000.

Thorsen, Gunnar. Extraction and separation of metals from solids using liquid cation exchangers. 4,200,504, Cl. 204-108.000.

Timex Corporation: *See—*
Hsu, Ying Y., 4,200,580, Cl. 260-340.700.

Timlin, James J.: *See—*
Black, Adam R.; and Timlin, James J., 4,200,103, Cl. 128-290.00W.

Tiner, Robert L.: *See—*
Burnham, John W.; and Tiner, Robert L., 4,200,539, Cl. 252-8.55R.

Tipton, David G.: *See—*
Smith, Darrell F., Jr.; Tipton, David G.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., 4,200,459, Cl. 75-170.000.

Tischenko, Oleg I.: *See—*
Vydrin, Vladimir N.; Berezin, Evgeny N.; Tischenko, Oleg I.; Dremin, Vladimir G.; and Koval, Grigory I., 4,199,970, Cl. 72-186.000.

Tjan, Petrus W. H. L.: *See—*
Kwant, Pieter B.; Kanbier, Dirk; Tjan, Petrus W. H. L.; and Akbar, Mohammed, 4,200,519, Cl. 208-77.000.

Tlach, Hugo; Leifels, Klaus-Dieter; and Mischler, Werner, to Ciba-Geigy Corporation. Process for producing sized paper or cardboard with dyes or optical brighteners and epoxide-amine-polyamide reaction products. 4,200,489, Cl. 162-162.000.

Todd, Donald K.: *See—*
Gaddis, Joseph L.; Brandon, Craig A.; and Todd, Donald K., 4,200,533, Cl. 210-195.200.

Tokuyama Soda Kabushiki Kaisha: *See—*
Onoue, Yasuharu; Sata, Toshikatsu; Nakahara, Akihiko; and Itoh, Junichi, 4,200,711, Cl. 525-387.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Takeuchi, Masaya; and Hendrickson, Phillip H., 4,200,376, Cl. 354-62.000.

Tokyo Shibaura Elecric Co., Ltd.: *See—*
Suzuki, Etsuji; Yasue, Itaru; and Kashihama, Tomio, 4,200,393, Cl. 356-73.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Kawamura, Kazumitu; and Yahata, Mitsuru, 4,200,795, Cl. 250-402.000.
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.
Saito, Kiyoto, 4,200,799, Cl. 250-445.00T.
Tanaka, Shikei; Kobayashi, Tetsuji; Matsuo, Noboru; and Takahashi, Haruo, 4,200,814, Cl. 307-309.000.

Tolman, Richard L.: *See—*
Fisher, Michael H.; Lusi, Aino; and Tolman, Richard L., 4,200,581, Cl. 424-180.000.

Tomcufcik, Andrew S.: *See—*
Wright, William B., Jr.; and Tomcufcik, Andrew S., 4,200,748, Cl. 544-99.000.

Tomy Kogyo Co., Inc.: *See—*
Kaga, Takashi, 4,200,284, Cl. 273-1.00R.

Tondeur, Gerard: *See—*
Marjollet, Jacques; Tondeur, Gerard; Cerdan, Jean-Pierre; and Talleu, Patrick, 4,200,443, Cl. 55-347.000.

Toropainen, Jorma, to Oy Wartsila AB. Loading arrangement for a cylinder stack. 4,200,045, Cl. 101-217.000.

Touborg, Jorn, to F. L. Smidth & Co. Method of firing a rotary kiln and apparatus therefor. 4,200,469, Cl. 106-100.000.

Toyama Chemical Company, Limited: *See—*
Saikawa, Isamu; Takano, Shuntaro; Imaizumi, Hiroyuki; Takakura, Isamu; Ochiai, Hirokazu; Yasuda, Takashi; Taki, Hideo; Tai, Masuru; and Kodama, Yutaka, 4,200,744, Cl. 544-21.000.

Toyama, Masamichi: *See—*
Iwama, Hideto; and Toyama, Masamichi, 4,200,372, Cl. 354-43.000.

Toyo Kogyo Co., Ltd.: *See—*
Inami, Fumiaki; and Okada, Akiyosi, 4,200,329, Cl. 296-69.000.

Toyo Seiyaku Kasei Co., Ltd.: *See—*
Okuda, Hirohisa; and Hori, Nobutaka, 4,200,626, Cl. 424-51.000.

Toyo Soda Manufacturing Co. Ltd.: *See—*
Seita, Toru; Takahashi, Kenji; Asami, Shunichi; and Shimizu, Akihiko, 4,200,538, Cl. 210-500.00M.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ban, Masashi; Tachino, Tomio; and Kizaki, Jiro, 4,200,205, Cl. 220-20.500.
Hattori, Kyo, 4,199,939, Cl. 60-276.000.
Horie, Mitsuyuki, 4,199,951, Cl. 60-613.000.
Ishida, Yasuhiko, 4,200,083, Cl. 123-198.00F.
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, 4,200,552, Cl. 252-466.0PT.

Trane Company, The: *See—*
Linnert, Peter J., 4,200,426, Cl. 417-312.000.

Trautvetter, Werner; and Weisgerber, Gregor, to Dynamit Nobel Aktiengesellschaft. Polyvinylidene fluoride compositions, and fabri-

cated products thereof having increased notch impact toughness and elongation at rupture. 4,200,568, Cl. 260-42.470.
Treadwell, Kenneth, to M&T Chemicals Inc. Catalyst composition for rigid polyurethane foams. 4,200,699, Cl. 521-124.000.
Trenne, Myron U., to General Motors Corporation. Hydraulic valve actuator and fuel injection system. 4,200,067, Cl. 123-90.120.
Tricon, Alfred J., to Sperry-Sun, Inc. Side entry clamp and packoff. 4,200,297, Cl. 277-102.000.
Tripoteau, Jean. Bottomless bucket for hoist conveyors. 4,200,184, Cl. 198-713.000.
Trocellier, Roger: *See*—
Hawkes, Thaddeus; Reymond, Jean C.; and Trocellier, Roger, 4,200,356, Cl. 350-96.160.
Trushell, James B.: *See*—
Lamoureux, William R.; Martin, William J.; and Trushell, James B., 4,200,868, Cl. 340-713.000.
Trutzschler GmbH & Co. KG: *See*—
Durselen, Hans J., 4,200,020, Cl. 83-643.000.
Leifeld, Ferdinand; Beneke, Wolfgang; and Trutzschler, Hermann, 4,199,843, Cl. 19-240.000.
Trutzschler, Hermann: *See*—
Leifeld, Ferdinand; Beneke, Wolfgang; and Trutzschler, Hermann, 4,199,843, Cl. 19-240.000.
Tsugaya, Hitoshi: *See*—
Ishii, Kiyoshi; Suzuki, Ryoshu; Honda, Zenjiro; and Tsugaya, Hitoshi, 4,200,726, Cl. 528-99.000.
Tsui, James B. Y., to United States of America, Air Force. Dual detection scheme for compressive receivers. 4,200,840, Cl. 455-226.000.
Tsuji, Sadahiko; and Sato, Yasuhisa, to Canon Kabushiki Kaisha. Wide-angle type zoom lens. 4,200,358, Cl. 350-184.000.
Tsuji, Sadahiko: *See*—
Sato, Yasuhisa; Tsuji, Sadahiko; Ishikawa, Kazuo; and Matsumura, Susumu, 4,200,380, Cl. 354-219.000.
Tsujii, Norihiro: *See*—
Nakahara, Yoshihiko; Tsujii, Norihiro; Nakanishi, Kenichi; Terada, Katsuaki; Sakai, Yuji; Sunahara, Toshitaka; and Ito, Shinobu, 4,200,051, Cl. 113-120.00D.
Tsukada, Tameyasu: *See*—
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.
Tsukamoto, Kazuyoshi: *See*—
Nagata, Yoshinosuke; Kutsuyama, Hiroshi; Yamada, Makoto; and Tsukamoto, Kazuyoshi, 4,200,841, Cl. 455-169.000.
Tuba, Zoltan; Marsai, Maria; Gorog, Sandor; Biro, Katalin; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 3-Amino-17a-aza-D-homoandrostane compounds, and pharmaceutical compositions containing them. 4,200,636, Cl. 424-250.000.
Tubb, Thomas L., Jr.: *See*—
Bitting, James L.; and Tubb, Thomas L., Jr., 4,199,854, Cl. 29-426.500.
Tucker, Robert J., to American Cyanamid Company. Use of nickel phenolate of o,o'-bis(p-1,1,3,3-tetramethylbutylphenol)sulfone and a phosphite in dyeing polyolefins. 4,200,433, Cl. 8-42.00D.
Tuleja, Anthony Z. Drain traps with strainer means. 4,199,827, Cl. 4-289.000.
Tung, Lu H.; Lo, Grace Y-S.; Rakshys, Joseph W.; and Beyer, Douglas E., to Dow Chemical Company, The. Multifunctional lithium containing initiator. 4,200,718, Cl. 526-173.000.
Turner, Clarence C., to RCA Corporation. Fixture for holding a faceplate and a funnel of a CRT during sealing. 4,200,274, Cl. 269-319.000.
Tyson, Raymond K. Bobber stopper. 4,200,190, Cl. 206-315.00R.
Uchida Sharyo Co., Ltd.: *See*—
Uchida, Suekichi, 4,200,331, Cl. 297-45.000.
Uchida, Suekichi, to Uchida Sharyo Co., Ltd. Folding chair. 4,200,331, Cl. 297-45.000.
Uchidoi, Masanori: *See*—
Aizawa, Hiroshi; Uchidoi, Masanori; Nakamura, Zenzo; and Takishima, Yoshiyuki, 4,200,370, Cl. 354-33.000.
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,200,374, Cl. 354-60.00R.
Uchiyama, Takashi: *See*—
Suzuki, Ryoichi; Taguchi, Tetsuya; Suzuki, Toyotosi; Sanada, Noriaki; Tezuka, Nobuo; and Uchiyama, Takashi, 4,200,371, Cl. 354-21.000.
Ueda, Hiroo: *See*—
Kiyota, Kohei; Ueda, Hiroo; Kitagawa, Shunji; and Tasai, Kunihiko, 4,200,461, Cl. 430-91.000.
Ueda, Hiroshi, to Kawasaki Jukogyo Kabushiki Kaisha. Liner in grinding mill. 4,200,242, Cl. 241-183.000.
Ueda, Katsunobu: *See*—
Moriwaki, Yoshinaga; Kamiya, Masashi; Ueda, Katsunobu; Terashima, Masaharu; Aikawa, Tetsuo; Tsukada, Tameyasu; and Ohshio, Hirosuke, 4,199,996, Cl. 74-89.150.
Ueda, Kazuo, to Ueda Works Co., Ltd. Pressure relief valve for blood pressure measuring instrument. 4,200,259, Cl. 251-285.000.
Ueda Works Co., Ltd.: *See*—
Ueda, Kazuo, 4,200,259, Cl. 251-285.000.
Ueno, Kenji: *See*—
Tarumi, Noriyoshi; and Ueno, Kenji, 4,199,985, Cl. 73-351.000.
Ueno, Masahiro; and Masuda, Ikuro, to Hitachi, Ltd. Diagnostic check system for digital signal circuit. 4,200,225, Cl. 371-27.000.
Ueno, Sadayasu: *See*—
Sato, Kanemasa; Ueno, Sadayasu; and Ichikawa, Norio, 4,200,511, Cl. 204-195.00S.
Ugine Aciers: *See*—
Lamaze, Airy P., 4,200,612, Cl. 423-70.000.
Um, Richard T.: *See*—
Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., 4,200,455, Cl. 75-91.000.
Underwood, Max E., to Badger Company, Inc., The. Method of preheating a liquid reaction mass of polyolefin dissolved in liquid monomer. 4,200,145, Cl. 526-64.000.
Unger, Gerrit: *See*—
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.
Union Carbide Corporation: *See*—
Stanley, Priscilla B.; and Anderson, Donald F., 4,200,704, Cl. 525-409.000.
Welter, Charles R.; Liss, Barry; Davis, Hubert G.; and Albright, Charles W., 4,200,494, Cl. 201-9.000.
Union Oil Company of California: *See*—
Gallus, Julius P., 4,200,153, Cl. 166-292.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Hakluytt, John P. D., 4,199,935, Cl. 60-734.000.
United States of America
Agriculture: *See*—
Powell, Richard G., 4,200,639, Cl. 424-256.000.
Air Force: *See*—
Galanos, Demosthenes G., 4,200,875, Cl. 346-1.100.
Sifferlen, Thomas P.; and Steudel, Fritz, 4,200,872, Cl. 343-7.500.
Tsui, James B. Y., 4,200,840, Cl. 455-226.000.
America: *See*—
Knazek, Richard A.; Gullino, Pietro M.; and Frankel, David S., 4,200,689, Cl. 435-2.000.
Peterson, John I.; and Goldstein, Seth R., 4,200,110, Cl. 128-634.000.
Wilkins, Judd R.; and Stoner, Glenn E., 4,200,493, Cl. 435-291.000.
Army: *See*—
Bains, William R., 4,200,028, Cl. 89-142.000.
Bartlett, Oliver H., Jr.; and Izard, Charles B., 4,200,394, Cl. 356-347.000.
Croomes, Edgar F.; and Murfree, James A., 4,200,608, Cl. 422-97.000.
Energy: *See*—
Petrick, Michael; Pierson, Edward S.; and Schreiner, Felix, 4,200,815, Cl. 310-11.000.
Salzman, Gary C.; and Skogen Hagenson, Mary J., 4,200,802, Cl. 250-461.00B.
Schuresko, Daniel D., 4,200,801, Cl. 250-458.000.
Stark, Eugene E., Jr.; Kephart, John F.; Leland, Wallace T.; and Reichelt, Walter H., 4,200,846, Cl. 331-94.50R.
Weldon, William F.; Driga, Mircea D.; and Woodson, Herbert H., 4,200,831, Cl. 322-8.000.
Health, Education and Welfare: *See*—
Walker, Elijah C.; and Cascio, Horace E., 4,200,806, Cl. 250-577.000.
Interior: *See*—
Fraley, Jack E.; Sommers, Earl F.; Strang, Shorter; and McConnell, W. C., 4,200,232, Cl. 239-112.000.
Fryberger, Steven G.; and Ahlbrandt, Thomas S., 4,199,974, Cl. 73-28.000.
Matta, Joseph E.; and Kissell, Fred N., 4,200,036, Cl. 98-50.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Paciorek, Kazimiera J. L. Heat resistant polymers of oxidized styrylphosphine. 4,200,721, Cl. 526-261.000.
National Aeronautics and Space Administration: *See*—
Fortini, Anthony; and Kazaroff, John M., 4,199,937, Cl. 60-267.000.
Navy: *See*—
Evans, David J.; and Bradley, Clark F., 4,200,859, Cl. 367-1.000.
Evans, David J.; and Bradley, Clark F., 4,200,920, Cl. 367-1.000.
Fletcher, Aaron N., 4,200,686, Cl. 429-112.000.
Hagemann, Julius, 4,200,922, Cl. 367-96.000.
Henry, Ronald A., 4,200,753, Cl. 546-116.000.
Page, Robert E.; and Brackett, Raymond B., 4,200,919, Cl. 365-230.000.
Schaefer, Robert J.; and Ayers, Jack D., 4,200,669, Cl. 427-53.100.
Seeley, Elwin W., 4,200,873, Cl. 343-710.000.
Thies, Fred W., 4,200,923, Cl. 367-123.000.
Thompson, James P., 4,200,898, Cl. 361-58.000.
U.S. Philips Corporation: *See*—
Blom, Hendrik, 4,200,888, Cl. 358-162.000.
de Jong, Nicolaas J.; and Custers, Adrianus C. W., 4,200,853, Cl. 336-192.000.
Fischer, Karl; and Stebegg, Josef, 4,200,250, Cl. 242-199.000.
Janssen, Peter J. H., 4,200,882, Cl. 358-29.000.
Klomp, Franciscus M., 4,200,192, Cl. 206-418.000.
Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,200,851, Cl. 335-210.000.
Van Den Avoort, Pieter M., 4,200,887, Cl. 358-162.000.
Van Schaik, Gerrit P. J.; and Bosboom, Wim, 4,200,813, Cl. 307-300.000.

United States Steel Corporation: *See*—
Dinello, Julio G., 4,200,498, Cl. 202-248.000.
United Technologies Corporation: *See*—
Sederquist, Richard A., 4,200,682, Cl. 429-17.000.
Universal Matthey Products S.A.: *See*—
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.
University of California, The Regents of the: *See*—
Chappell, Terry I.; and White, Richard M., 4,200,472, Cl. 136-89.0PC.
Hodges, David A.; Gray, Paul R.; and McCreary, James L., 4,200,863, Cl. 340-347.0AD.
University of Illinois Foundation: *See*—
Malocha, Donald C., 4,200,849, Cl. 333-194.000.
University of Pennsylvania: *See*—
Cox, Malcolm; and Singer, Irwin, 4,200,630, Cl. 424-227.000.
University of Southampton, The: *See*—
Binns, Kenneth J.; and Woolley, Ronald W., 4,200,344, Cl. 308-9.000.
University of Virginia: *See*—
Wilkins, Judd R.; and Stoner, Glenn E., 4,200,493, Cl. 435-291.000.
UOP Inc.: *See*—
Bradbury, James A.; Stauter, John C.; Um, Richard T.; Stephens, Frank A.; and Auck, Yoon T., 4,200,455, Cl. 75-91.000.
Koehler, Raymond A., 4,200,218, Cl. 228-165.000.
Upjohn Company, The: *See*—
Ayer, Donald E., 4,200,740, Cl. 542-426.000.
Dai, Sheng-Hong A., 4,200,763, Cl. 560-109.000.
Kelly, Robert C., 4,200,739, Cl. 542-426.000.
Lednicer, Daniel, 4,200,588, Cl. 260-571.000.
Ura, Mitsuru: *See*—
Suzuki, Takaya; Ura, Mitsuru; and Ogawa, Takuzo, 4,200,877, Cl. 357-13.000.
Uriaub, Alfred; and Muller, Eckart, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Fuel injector. 4,200,237, Cl. 239-533.120.
Urosevic, Milica: *See*—
Komminoth, Paul; Robinson, Tibor; and Urosevic, Milica, 4,200,564, Cl. 260-29.40R.
Vagac, Svetozar; Prochazka, Bretislav; Mueller, Jiri; Kostka, Anton; and Carsky, Milan, to Vyskumny ustav papieru a celulozy. Method of and apparatus for reclaiming metals and plastics from scrap paper. 4,200,486, Cl. 162-8.000.
Valchev, Alexander Y.: *See*—
Savov, Peter H.; Peev, Vassil G.; Valchev, Alexander Y.; and Lingorski, Nikola A., 4,200,452, Cl. 75-12.000.
Valdemarsson, Lars S.: *See*—
von Knorring, Folke; Lindkvist, Sven F.; and Valdemarsson, Lars S., 4,199,978, Cl. 73-133.00R.
Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Combination VHF and UHF tuner arrangement. 4,200,850, Cl. 334-1.000.
Valdois, Michel; Levesque, Patrick; and Hartemann, Pierre, to Thomson-CSF. Elastic surface wave accelerometer. 4,199,990, Cl. 73-517.0AV.
Vall, Seymour, to Falcon Safety Products, Inc. Mooring cinch. 4,200,053, Cl. 114-230.000.
Valley Forge Stove Co.: *See*—
Kolb, Robert C., 4,200,086, Cl. 126-66.000.
Valleylab, Inc.: *See*—
Harris, Frank W., 4,200,104, Cl. 128-303.140.
Van Daele, Antoine, to Chore-Time Equipment, Inc. Hog feeder. 4,200,060, Cl. 119-56.00R.
Van Den Avoort, Pieter M., to U.S. Philips Corporation. Television camera. 4,200,887, Cl. 358-162.000.
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., to Janssen Pharmaceutica, N.V. 1-[(Heterocyclyl)-alkyl]-4-diarylmethoxy piperidine derivatives. 4,200,641, Cl. 424-267.000.
van den Haak, Gerardus M.: *See*—
Dorrepaal, Wim; and van den Haak, Gerardus M., 4,200,522, Cl. 209-166.000.
Van der Aa, Marcel J. M. C.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,200,641, Cl. 424-267.000.
Vanderford, William D.: *See*—
Farrow, James T.; Vanderford, William D.; and Taylor, Ernest E., 4,199,856, Cl. 29-454.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Overload couplings. 4,199,963, Cl. 64-28.00R.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely N.V. Soil cultivating implements. 4,200,156, Cl. 172-59.000.
van der Lely, Cornelis. Mowing machine. 4,199,922, Cl. 56-13.600.
van der Loos, Jozef L. M.; and Duijzings, Wilhelmus G., to Stamicarbon, B.V. Process for the preparation of copolymers containing low monomer content. 4,200,593, Cl. 525-243.000.
Vandierendonck, Jerry L.: *See*—
Cochran, Michael J.; and Vandierendonck, Jerry L., 4,200,926, Cl. 364-200.000.
Van Fossen, Harvey G.: *See*—
Neidigh, Robert J.; and Van Fossen, Harvey G., 4,199,905, Cl. 51-429.000.
Van Heertum, Albert H. M. Th.: *See*—
Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,200,641, Cl. 424-267.000.
Van Nocker, Melvin; and Larson, Charles R., to Prab Conveyors, Inc. Harpoon type conveyor control system. 4,200,185, Cl. 198-718.000.
Van Orden, Lawrence; and Wilson, David G. Fishing float. 4,199,889, Cl. 43-43.110.
Van Peppen, Jan F.; and Fisher, William B., to Allied Chemical Corporation. Process for producing cyclohexanone. 4,200,553, Cl. 252-447.000.
Van Schaik, Gerrit P. J.; and Bosboom, Wim, to U.S. Philips Corporation. Circuit arrangement comprising a high-voltage power transistor. 4,200,813, Cl. 307-300.000.
Van Steenwyk, Donald H., to Applied Technologies Associates. Mapping apparatus employing two input axis gyroscopic means. 4,199,869, Cl. 33-302.000.
Varian Associates: *See*—
Nunan, Craig S., 4,200,844, Cl. 328-230.000.
Varian Associates, Inc.: *See*—
Symons, Robert S., 4,200,820, Cl. 315-4.000.
Varker, Charles J.: *See*—
Liaw, H. Ming; and Varker, Charles J., 4,200,621, Cl. 423-348.000.
Vasquez, Orsolina L., to Free Form, Inc. Blouse. 4,199,822, Cl. 2-106.000.
Veach Development Company, Inc.: *See*—
Hansen, Edwin L.; and Hansen, Amy L., 4,199,873, Cl. 34-202.000.
VEB Kombinat Fortschritt Landmaschinen Neustadt in Sachsen: *See*—
Eistert, Theodor; Noack, Christian; Zumpe, Bernd; Bergmann, Konrad; Schmidt, Gerhard; Teichmann, Manfred; Spaida, Hans-Peter; Unger, Gerrit; and Hauschild, Arthur, 4,199,924, Cl. 56-98.000.
Vee, Per: *See*—
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.
Veeder Industries Inc.: *See*—
Evans, Alfred C.; and Smilgys, Bruno S., 4,200,785, Cl. 235-92.0FL.
Velan, Adolf K., to Velan Engineering Ltd. Method of making a diaphragm valve. 4,199,850, Cl. 29-157.10R.
Velan Engineering Ltd.: *See*—
Velan, Adolf K., 4,199,850, Cl. 29-157.10R.
Verdier, Jean-Pierre: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,200,935, Cl. 364-717.000.
Verdol S.A.: *See*—
Vessella, Patrick, 4,199,929, Cl. 57-279.000.
Vessella, Patrick, to Verdol S.A. Device for pneumatically threading yarn for a double twist spindle. 4,199,929, Cl. 57-279.000.
Vested, Harry S. Method and apparatus for gravure printing that includes line work. 4,200,044, Cl. 101-170.000.
Vicari, Ronald P.; and Yampol, Barry, to Graphic Scanning Corp. Computer controlled telephone answering system. 4,200,772, Cl. 179-27.0FH.
Victor Equipment Company: *See*—
Monschke, Charles P., 4,200,235, Cl. 239-424.500.
View Engineering, Inc.: *See*—
Hubach, Richard A.; DeZotell, Gary L.; and Sacks, Jack, 4,200,861, Cl. 340-146.30Q.
Vik, Kai M.: *See*—
Einan, Gerhard; Gruben, Arne; Klungseth, Erling; Magnussen, Ingar; Moen, Olav O.; Vee, Per; and Vik, Kai M., 4,200,140, Cl. 164-105.000.
Vink, Nicolaas G.: *See*—
Nieuwendijk, Joris A. M.; and Vink, Nicolaas G., 4,200,851, Cl. 335-210.000.
Vlasov, Valentin M.: *See*—
Kalinichenko, Anatoly Y.; Vlasov, Valentin M.; and Kiksman, Grigory E., 4,200,908, Cl. 363-124.000.
Vock, Manfred H.: *See*—
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,741, Cl. 544-5.000.
Shu, Chi-Kuen; Mookherjee, Braja D.; and Vock, Manfred H., 4,200,742, Cl. 544-5.000.
Voest-Alpine Aktiengesellschaft: *See*—
Laimer, Friedrich, 4,200,263, Cl. 266-142.000.
Riegler, Ernst; and Schmidt, Manfred, 4,200,210, Cl. 222-598.000.
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Vogel, Christian; and Aebi, Rudolf, to Ciba-Geigy Corporation. Plant growth regulating agent. 4,200,451, Cl. 71-118.000.
Voisin, Norbert: *See*—
Hoffmann, Jean-Claude; Castanie, Francis; Crabere, Henri; Verdier, Jean-Pierre; and Voisin, Norbert, 4,200,935, Cl. 364-717.000.
Voith Getriebe KG.: *See*—
Dick, Heinrich, 4,200,175, Cl. 192-0.033.
Volkswagenwerk Aktiengesellschaft: *See*—
Szabo, Laszlo, 4,200,307, Cl. 280-668.000.
Volman, Mikhail Y.; Grinshtein, Vladimir Y.; Zhukov, Mikhail L.; and Kuchuk, Ivan A. Outdoor high-voltage switchgear. 4,200,899, Cl. 361-333.000.
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Voss, Klaus: *See*—
Hager, Klaus; and Voss, Klaus, 4,200,417, Cl. 408-67.000.
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Pennings, Albertus J.; and Vossebeld, Arnold, 4,200,579, Cl. 260-33.6AQ.

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Voth, Elmer D.: *See*—
Mullet, David L.; Rilling, Raymond J.; and Voth, Elmer D., 4,200,155, Cl. 172-14.000.
Vsesojuzny Nauchno-Issledovatelsky Institut Vagonostroenia: *See*—
Kalinichenko, Anatoly Y., 4,200,825, Cl. 318-312.000.
Kalinichenko, Anatoly Y.; Vlasov, Valentin M.; and Kiksman, Grigory E., 4,200,908, Cl. 363-124.000.
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Vydrin, Vladimir N.; Berezin, Evgeny N.; Tischenko, Oleg I.; Dremin, Vladimir G.; and Koval, Grigory I. Method and mill rolls for metal bar rolling. 4,199,970, Cl. 72-186.000.
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W. Hegenscheidt Gesellschaft mbH, Firma: *See*—
Wittkopp, Helmut; and Kunze, Bernhard, 4,200,012, Cl. 82-1.00C.
Waite, Howard W. Smoking appliance. 4,200,114, Cl. 131-178.000.
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Allan, Iain D.; and Walberg, Per-Erik, 4,200,928, Cl. 364-200.000.
Walker, Dale C., to General Electric Company. Large-diameter dust guard for a locomotive axle bearing. 4,200,345, Cl. 308-36.100.
Walker, Elijah C.; and Cascio, Horace E., to United States of America, Health, Education and Welfare. Scanning flow indicator for rotameters. 4,200,806, Cl. 250-577.000.
Wallace Murray Corporation: *See*—
Bremer, Robert C., Jr., 4,200,004, Cl. 74-574.000.
Walsh, Michael M.: *See*—
Meyer, Lawrence L.; Mueller, Robert S.; and Walsh, Michael M., 4,200,081, Cl. 123-198.00F.
Walter, Friedrich C.; and Portele, Ludwig, to Argus Gesellschaft mbH. Quick-closure coupling for hydraulic lines. 4,200,121, Cl. 137-614.050.
Wang, Clifford. Elastic pull type exercising device. 4,200,281, Cl. 272-138.000.
Wangermann, Jochen, to Gruner & Jahr AG & Co. Collating machine. 4,200,275, Cl. 270-53.000.
Ward, Donald D.; and Emigh, Arthur W., Jr., to Ward Systems, Inc. Automatic hold speed setting control method and apparatus used with a continuous automatic wood veneer dryer conveyor speed control monitoring computer apparatus. 4,199,871, Cl. 34-25.000.
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Ward, Donald D.; and Emigh, Arthur W., Jr., 4,199,871, Cl. 34-25.000.
Warkentin, Ralph. Sanitation device. 4,200,321, Cl. 294-1.0BA.
Warncke, Ernst; and Pasternack, Adalbert, to Dragerwerk Aktiengesellschaft. Respirator having an oxygen-releasing chemical cartridge. 4,200,092, Cl. 128-202.260.
Warner, Norman E.: *See*—
Adams, Cecil L.; and Warner, Norman E., 4,199,960, Cl. 62-503.000.
Warner, Paul L., Jr.; and Luber, Edward J., Jr., to Westwood Pharmaceuticals Inc. 4-Substituted imidazo [1,2-a]quinoxalines. 4,200,750, Cl. 544-346.000.
Warren's Turf Nursery: *See*—
Blake, Duane, 4,199,923, Cl. 56-14.500.
Watanabe, Kazuo: *See*—
Makabe, Hachiro; and Watanabe, Kazuo, 4,200,048, Cl. 112-158.00E.
Watanabe, Mutsuo: *See*—
Hasebe, Mitsuo; Watanabe, Mutsuo; Hibi, Kunio; and Watanuki, Masayosi, 4,200,388, Cl. 355-3.0DD.
Watanabe, Shigeru; Ishida, Michiyasu; and Iwasaki, Hideo, to Mitsubishi Jukogyo Kabushiki Kaisha. Nursing system. 4,199,829, Cl. 5-81.00R.
Watanabe, Shoji: *See*—
Kubo, Masyoshi; Nakanishi, Michio; and Watanabe, Shoji, 4,200,560, Cl. 260-22.0EP.
Watanuki, Masayosi: *See*—
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Murakami, Saburo, 4,199,995, Cl. 74-54.000.
Watkins, Bruce J., to Regan Offshore International, Inc. Subsea flowline connector. 4,200,312, Cl. 285-18.000.
Watkins, Harold E. Horse anti-bucking trainer. 4,199,921, Cl. 54-71.000.
Watson, James B. Apparatus for mounting a percussion instrument. 4,200,024, Cl. 84-421.000.
Weatherford Oil Tool Co., Ltd.: *See*—
Drury, Frederick H., 4,199,866, Cl. 366-139.000.
Webinger, George, to Champion International Corporation. Product display carton. 4,200,188, Cl. 206-45.140.
Weelpal A.G.: *See*—
Haldimann, Hans R., 4,200,421, Cl. 414-280.000.
Wegeng, Wendell A. Safety ski boot structure. 4,199,879, Cl. 36-121.000.
Wehrmeister, Herbert L., to International Minerals & Chemical Corporation. Method of controlling the growth of microorganisms using nitroalkyl thiocyanates. 4,200,646, Cl. 424-302.000.
Weigert, Kurt, to Siemens Aktiengesellschaft. Electromedical apparatus. 4,200,108, Cl. 128-419.00R.
Weil, Hans H. Device for making rectangular cuts, prints and/or stampings. 4,200,429, Cl. 425-295.000.
Weimer, Paul K., to RCA Corporation. Solid state image sensor. 4,200,892, Cl. 358-213.000.
Weisang, Joseph E.: *See*—
Muller, Alain; Engelhard, Philippe; and Weisang, Joseph E., 4,200,623, Cl. 423-644.000.
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Weisgerber, Gregor: *See*—
Trautvetter, Werner; and Weisgerber, Gregor, 4,200,568, Cl. 260-42.470.
Weldon, William F.; Driga, Mircea D.; and Woodson, Herbert H., to United States of America, Energy. Compensated pulsed alternator. 4,200,831, Cl. 322-8.000.
Welsh, Clarke T., to Logansport Distributors Inc. Removable flow director for kitchen exhaust system. 4,200,087, Cl. 126-299.00R.
Welter, Charles R.; Liss, Barry; Davis, Hubert G.; and Albright, Charles W., to Union Carbide Corporation. Method of preventing defluidization of carbonaceous particles. 4,200,494, Cl. 201-9.000.
Welter, Charles R.: *See*—
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Wemyss, Sheila Mary: *See*—
Wemyss, William A., 4,199,982, Cl. 73-229.000.
Wemyss, William A., to Wemyss, Sheila Mary. Liquid flowmeters. 4,199,982, Cl. 73-229.000.
Wenschhof, Donald E., Jr.: *See*—
Smith, Darrell F., Jr.; Tipton, David G.; Clatworthy, Edward F.; and Wenschhof, Donald E., Jr., 4,200,459, Cl. 75-170.000.
Wepler, Manfred, to General Motors Corporation. Air-deflecting arrangement. 4,200,327, Cl. 296-15.000.
Werner, Paul: *See*—
Cremer, Heinz P.; and Werner, Paul, 4,200,333, Cl. 297-362.000.
Wessel, Wolf: *See*—
Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, 4,200,076, Cl. 123-140.0CC.
West, Allen D., to Chinquapin Corporation. Can top opener. 4,200,198, Cl. 220-269.000.
Western Electric Company, Inc.: *See*—
Segal, Paul D.; and Wong, Ching-Ping, 4,200,668, Cl. 427-53.100.
Westinghouse Air Brake Company: *See*—
Gilcher, Heinz, 4,200,855, Cl. 338-5.000.
Gilcher, Heinz, 4,200,856, Cl. 338-5.000.
Westinghouse Electric Corp.: *See*—
Albaric, Jacques E.; Coyle, Forrest E.; and Sherlock, Thomas P., 4,200,784, Cl. 219-470.000.
Bains, Gurdip S.; Martin, Niles J.; and Jackson, Leigh F., 4,199,907, Cl. 52-125.000.
DeLaurentis, Angelo A.; Zola, Frank G., Jr.; and Specht, Theodore R., 4,200,854, Cl. 336-217.000.
Gerkey, Kenneth S.; and Smith, Edward H., 4,200,424, Cl. 414-744.000.
Gorton, William S., Jr.; and Buckley, Richard D., 4,199,862, Cl. 29-605.000.
Jackovitz, John F.; and Pantier, Earl A., 4,200,337, Cl. 299-5.000.
Meuschke, Robert E.; and Beer, Robert W., 4,199,857, Cl. 29-157.400.
Meuschke, Robert E.; Andrews, Harry N.; and Massaro, Anthony A., Jr., 4,200,172, Cl. 182-46.000.
Ruffing, Charles R.; Gause, Smith A.; Botts, John C.; and Smith, Harry E., 4,200,818, Cl. 310-214.000.
Schrock, Steven L.; and Mangus, James D., 4,199,975, Cl. 73-40.700.
Sherwood, Edward F., 4,199,885, Cl. 40-568.000.
Thiel, Peter H., 4,200,256, Cl. 248-548.000.
Westwood Pharmaceuticals Inc.: *See*—
Warner, Paul L., Jr.; and Luber, Edward J., Jr., 4,200,750, Cl. 544-346.000.
Wetton, Raymond E.; and James, David B., to National Research Development Corporation. Polymeric materials. 4,200,701, Cl. 525-4.000.
Weyerhaeuser Company: *See*—
Greenwood, Michael S., 4,199,897, Cl. 47-58.000.
Wheaton Industries: *See*—
Andrews, Karl H., 4,200,428, Cl. 425-136.000.
Wheelabrator-Frye Inc.: *See*—
Neidigh, Robert J.; and Van Fossen, Harvey G., 4,199,905, Cl. 51-429.000.
White Motor Corporation of Canada Ltd.: *See*—
Quick, Graeme R.; Harris, Walter E.; Riddle, Ernest J.; and Robinson, Terrence S., 4,199,925, Cl. 56-208.000.
White, Richard M.: *See*—
Chappell, Terry I.; and White, Richard M., 4,200,472, Cl. 136-89.0PC.
White, Ronald E.: *See*—
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Whitlow, Stanley M. Golf bag cover. 4,200,133, Cl. 150-52.00G.
Wiegandt, Herbert: *See*—
Scherrer, Claude; Baumann, Claude; Wiegandt, Herbert; Richmond, John-Russel; Siffert, Bernard; and Bourgeois, Claudine, 4,200,550, Cl. 252-335.000.
Wiek, Eduard. Shock-absorber. 4,200,268, Cl. 267-63.00R.

Wiener, Hans, to PressMaster A.B. Gripping or pressing appliance. 4,199,972, Cl. 72-409.000.

Wilcox, Raymond J., to Republic Corporation. Reinforced railway wheels and axles. 4,200,326, Cl. 295-23.000.

Wilkerson, Alan W. Power maximization circuit. 4,200,833, Cl. 323-20.000.

Wilkins, Judd R.; and Stoner, Glenn E., to United States of America, America; and University of Virginia. Microbial detection and enumeration apparatus. 4,200,493, Cl. 435-291.000.

Wilkinson Sword Limited: *See*—
Cox, Michael G. C., 4,200,437, Cl. 44-42.000.

William H. Rorer, Inc.: *See*—
Agar, Robert F., 4,200,057, Cl. 119-1.000.
Nuss, George W., Jr.; Santora, Norman J.; and Douglas, George H., 4,200,648, Cl. 424-308.000.

Williams, John B., Jr., to Fontaine Industries, Inc. Telescopic scope having an integrally formed saddle. 4,200,355, Cl. 350-10.000.

Williams, John H., Jr. Pyramid speaker assembly. 4,200,170, Cl. 181-155.000.

Williams, Norman E., to Bepex Corporation. Pulverizing and classifying apparatus with contaminant take-out. 4,200,241, Cl. 241-52.000.

Willis, Brian J.; Fischetti, Frank, Jr.; and Eilerman, Robert G., to Fritzsche Dodge & Olcott Inc. Flavoring compositions containing dialkyl-α,β-diacyl succinates. 4,200,659, Cl. 426-534.000.

Willis Oil Tool Co.: *See*—
Muchow, John D.; Jones, Graham J.; and Slegers, Maurice, 4,199,834, Cl. 15-104.06A.

Willis, Wilburn C., to Aluminum Company of America. Additive transfer unit with piercing member having a penetratable protective tip. 4,200,100, Cl. 128-272.300.

Willot, Henri A., to Centre de Recherche Fondamentale "Rivieren" S.P.R.L. Apparatus for neutralizing and purifying air. 4,200,442, Cl. 55-222.000.

Wilmeth, Claude H., to N-S-W Corporation. High power wrenching tool. 4,200,011, Cl. 81-57.390.

Wilson, David G.: *See*—
Van Orden, Lawrence; and Wilson, David G., 4,199,889, Cl. 43-43.110.

Wilson, Peter, to Aktiebolaget IRO. Yarn feed control system. 4,199,965, Cl. 66-125.00R.

Wilson, Robert K.; and Ewald, Jerome T., to Bendix Corporation, The. Integrated control for brake and steering systems. 4,199,946, Cl. 60-547.00B.

Winch, Allen R., to Cotton Incorporated. Impregnator/rinser. 4,199,966, Cl. 68-22.00R.

Wingler, Frank; Casper, Clemens; and Liebig, Lothar, to Bayer Aktiengesellschaft. Process for the anionic homo- or co-polymerization of aromatic vinyl compounds. 4,200,713, Cl. 526-64.000.

Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, to Firmenich & Cie. Aromatic sulfur flavoring agents. 4,200,660, Cl. 426-535.000.

Winter, William E.: *See*—
Gladrow, Elroy M.; and Winter, William E., 4,200,520, Cl. 208-120.000.

Witchell, Stanley P., to Engineering Components Limited. Filters. 4,200,444, Cl. 55-484.000.

Wittkopp, Helmut; and Kunze, Bernhard, to W. Hegenscheidt Gesellschaft mbH, Firma. Method and apparatus for truing railroad wheels. 4,200,012, Cl. 82-1.00C.

Woerpel, Marvin D. Snow making. 4,200,228, Cl. 239-25.000.

Wolber: *See*—
Duttlinger, Jean, 4,200,009, Cl. 81-15.600.

Wolf, Elmar: *See*—
Gras, Rainer; Obendorf, Johann; and Wolf, Elmar, 4,200,725, Cl. 528-49.000.

Wolfe, Saul, to Queens University at Kingston. 4-Chloroazetidinone. 4,200,571, Cl. 260-239.00A.

Wolinski, Leon E.; and Berezuk, Peter D., to Pratt & Lambert, Inc. Adhesive joining of pipes. 4,200,480, Cl. 156-294.000.

Wong, Ching-Ping: *See*—
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Woodson, Herbert H.: *See*—
Weldon, William F.; Driga, Mircea D.; and Woodson, Herbert H., 4,200,831, Cl. 322-8.000.

Woolley, Ronald W.: *See*—
Binns, Kenneth J.; and Woolley, Ronald W., 4,200,344, Cl. 308-9.000.

Wossner, Hugo. Ballet and toe-dance shoe. 4,199,878, Cl. 36-113.000.

Wright, George C.; and White, Ronald E., to Morton-Norwich Products, Inc. Methyl 3-(3-ethylureido)-1,2,5,6-tetrahydro-2-oxopyridine-4-carboxylate. 4,200,756, Cl. 546-297.000.

Wright Line Inc.: *See*—
Simone, James V.; and Sheppard, Kalin I., 4,200,239, Cl. 241-36.000.

Wright, William B., Jr.; and Tomcufcik, Andrew S., to American Cyanamid Company. Pyrido[1',2':4,5][1,4]oxazino[2,3-b]quinoxalines and pyrrolo[1',2':4,5][1,4]oxazino[2,3-b]quinoxalines. 4,200,748, Cl. 544-99.000.

Wuenschmann, Horst: *See*—
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Wulf, Horst-Dieter: *See*—
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Wurlitzer Company, The: *See*—
Carley, Joseph C.; and Ippolito, Anthony C., 4,200,022, Cl. 84-1.260.

Wurm, Jaroslav, to Institute of Gas Technology. Solid adsorption air conditioning apparatus and method. 4,199,959, Cl. 62-480.000.

Wurttembergische Metallwarenfabrik: *See*—
Anderl, Siegfried, 4,200,039, Cl. 99-302.00R.

Wyerman, Barry R.: *See*—
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Wyler, Siegfried: *See*—
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Xerox Corporation: *See*—
Agulnek, Martin A., 4,200,788, Cl. 250-235.000.

Yahagi, Mitsuhisa: *See*—
Takigawa, Hiroyoshi; and Yahagi, Mitsuhisa, 4,200,134, Cl. 152-209.00R.

Yahata, Mitsuru: *See*—
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Yamada, Junichi: *See*—
Nagasawa, Yasuo; and Yamada, Junichi, 4,200,793, Cl. 250-363.00S.

Yamada, Makoto: *See*—
Nagata, Yoshinosuke; Kutsuyama, Hiroshi; Yamada, Makoto; and Tsukamoto, Kazuyoshi, 4,200,841, Cl. 455-169.000.

Yamada, Osamu: *See*—
Nakagawa, Taizo; Ohmori, Kaoru; Mochizuki, Seiji; Tanaka, Eiichi; and Yamada, Osamu, 4,200,632, Cl. 424-230.000.

Yamagishi, Kiichiro; Hirose, Matutaro; and Muramatsu, Sachio, to Fuji Photo Film Co., Ltd. Web guide device. 4,200,211, Cl. 226-21.000.

Yamaguchi, Hisashi: *See*—
Chiba, Norio; Anzai, Hideyuki; Yamaguchi, Hisashi; Horigome, Koichi; Ishihara, Masao; and Terada, Sadatugu, 4,200,465, Cl. 430-527.000.

Yamamoto Kagaku Gosei Co., Ltd.: *See*—
Ikegami, Seiji; and Hatano, Yoshihiro, 4,200,751, Cl. 546-89.000.

Yamamoto, Noboru: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; Yamamoto, Noboru; and Soejima, Shigeo, 4,200,552, Cl. 252-466.0PT.

Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, to Sony Corporation. Solid state color television camera. 4,200,883, Cl. 358-44.000.

Yamashita, Shin: *See*—
Nonaka, Terumoto; Hotta, Tadahiko; and Yamashita, Shin, 4,200,879, Cl. 357-43.000.

Yamauchi, Kenji: *See*—
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Yamazaki, Kaoru; Kurioka, Shunichiro; Hatano, Takashi; Asada, Sadame; and Yasuda, Mariko, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of production of acrylonitrile polymer with vinylbenzyl sulfonic acids. 4,200,719, Cl. 526-220.000.

Yampol, Barry: *See*—
Vicari, Ronald P.; and Yampol, Barry, 4,200,772, Cl. 179-27.0FH.

Yanagi, Chota, to Kobe Steel, Limited. Tubular membrane separation apparatus. 4,200,531, Cl. 210-137.000.

Yang, Kei-Hsiung; and Kingsley, Jack D., to General Electric Company. Closed-chamber high-pressure gas ion-flow electro-radiography apparatus with direct-charge readout. 4,200,790, Cl. 250-315.200.

Yashunskaya, Tamara V.: *See*—
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Yasuda, Mariko: *See*—
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Yasue, Itaru: *See*—
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Yasuhara, Minoru: *See*—
Imamura, Tetuo; Yasuhara, Minoru; and Teramae, Masaru, 4,200,605, Cl. 264-145.000.

Yeagle, Richard J., to General Filters, Inc. Rotary drum humidifier. 4,200,598, Cl. 261-92.000.

Yeda Research and Development Co. Ltd.: *See*—
Avron, Mordhay; and Ben-Amotz, Ami, 4,199,895, Cl. 47-1.400.
Nudelman, Abraham; and Patchornik, Abraham, 4,200,747, Cl. 544-27.000.

Yokobayashi, Koji; and Sugimoto, Toshiyuki, to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo. Processes for producing glucan using Elsinoe. 4,200,693, Cl. 435-101.000.

Yokoyama, Akira, to Citizen Watch Co. Ltd. Connection terminal construction for driving coils of electronic timepieces. 4,199,931, Cl. 368-318.000.

Yoshida Iron Works Co. Ltd: *See*—
Fujii, Kenji, 4,200,456, Cl. 75-93.00G.

Yoshioka, Shigehiko; and Okada, Kaoru, to Seiko Kagaku Kogyo Co., Ltd. Sizing agent for use in making paper. 4,200,562, Cl. 260-29.6RW.

Young, Prussin MGK, J V.: *See*—
Young, Robert W.; Prussin, Samuel; and Gaylord, Norman G., 4,200,664, Cl. 427-4.000.

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Young, Wen. Flow control device for fluids flowing in a closed conduit. 4,199,981, Cl. 73-204.000.

Youngkin, Theodore C.: *See*—
Collins, Robert J.; Stutsman, Richard R.; and Youngkin, Theodore C., 4,200,201, Cl. 221-129.000.

Ysteboe, Howard T.: *See*—
Synstelien, Floyd L.; and Ysteboe, Howard T., 4,200,249, Cl. 242-96.000.

Yuta, Koichi, to Olympus Optical Co., Ltd. Lens system for micro film. 4,200,352, Cl. 350-1.200.

Zahnradfabrik Friedrichshafen AG: *See*—
Binger, Bernhard; and Engstler, Anton, 4,200,427, Cl. 418-32.000.
Dach, Hansjorg, 4,200,008, Cl. 74-869 000.
Ehrlinger, Friedrich; and Ott, Anton, 4,200,006, Cl. 74-681.000.
Elser, Dieter, 4,200,030, Cl. 91-375.00A.

Zakurdaev, Anatoly V.; and Luzhensky, Andrei B., to Moscovsky Inzhenerno-Fizichesky Institut. Device for switching electrical circuits. 4,200,779, Cl. 200-187.000.

Zandberg-Berger, Semen A.: *See*—
Kuzmak, Evsei M.; Koshelev, Nikolai N.; Khakimov, Anas N.; Yashunskaya, Tamara V.; Efimenko, Ljubov A.; Skuditsky, Mark S.; Zandberg-Berger, Semen A.; Bublki, Grigory I.; and Bronshtein, Lev M., 4,200,782, Cl. 219-73.100.

Zaniewski, Michel H. Modular ventilating assembly. 4,200,035, Cl. 98-43.00R.

Zappala, Giuseppe: *See*—
Farina, Attilio; and Zappala, Giuseppe, 4,200,824, Cl. 315-408.000.

Zavaras, Alexander A.; Sobolewski, Robert; Ryan, Robert E.; George, Michael J.; and Griffith, Cecil B., to Republic Steel Corporation. Process and apparatus for the continuous casting of metal using electromagnetic stirring. 4,200,137, Cl. 164-49.000.

Zeischegg, Walter; and Brussing, Bernd, to Hefendehl, Hans Friedrich. Nestable basket-type containers. 4,200,194, Cl. 206-507.000.

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Zimmerman, John A., Jr., to AMP Incorporated. Toolless retention system. 4,200,350, Cl. 339-91.00R.

Zimmermann, Klaus-Dieter: *See*—
Straubel, Max; Zimmermann, Klaus-Dieter; Wessel, Wolf; Sautter, Wilfried; and Stumpp, Gerhard, 4,200,076, Cl. 123-140.0CC.

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LIST OF REISSUE PATENTEES

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Access Controls System Pty. Ltd.: *See*—
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Brand, Warren H., to Yarway Corporation. Modulating flow control valve. Re. 30,261, Cl. 137-116.000.
Horvath, Stephen, to Access Controls System Pty. Ltd. Catch mechanism. Re. 30,263, Cl. 292-341.160.
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Mack, Grace M.: *See*—
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Agnone, Anthony R.; and Lucas, Michael P., to Gillette Company, The. Dispensing bottle. 254,838, 4-29-80, Cl. D9-9.000.
Aldrich, Thomas B., III, to Procter & Gamble Company, The. Bottle. 254,840, 4-29-80, Cl. D9-131.000.
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Gera, Mary Ann: *See*—
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Grunstad, Jerome A., to Ketcham & McDougall, Inc. Combined pencil caddy and perpetual calendar. 254,853, 4-29-80, Cl. D19-23.000.
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Gustavsson, Lennart, to AB Svenska Flaktfabriken. Air flow deflector. 254,866, 4-29-80, Cl. D23-139.000.
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Hayes, Jerry R., to L. R. Nelson Corporation. Hose coupling fitting. 254,863, 4-29-80, Cl. D23-44.000.
Healey, Arthur L. Combined plug and socket therefor. 254,847, 4-29-80, Cl. D13-24.000.
Hoadley, Howard W. X-ray film viewer. 254,868, 4-29-80, Cl. D24-2.000.
Johnson, Jerry L. End table or similar article. 254,827, 4-29-80, Cl. D6-177.000.
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Marsh, James W. Air freshner dispenser. 254,867, 4-29-80, Cl. D23-150.000.
Matsuda, Takehiko, to Toyostar Corporation. Light-intensity control contact switch. 254,849, 4-29-80, Cl. D13-38.000.
McNamee, Kathryn. Patriotic doll. 254,861, 4-29-80, Cl. D21-171.000.
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Skabelund, Floyd R.; and Skabelund, Donald. Stove. 254,864, 4-29-80, Cl. D23-97.000.
Sloan, Troy E. Costume. 254,816, 4-29-80, Cl. D2-79.000.
Smith, Ernest L., to Phillips Petroleum Company. Combined container and serving dish or the like. 254,831, 4-29-80, Cl. D7-17.000.
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Young, Lonas S. Flexible wrist band. 254,845, 4-29-80, Cl. D11-25.000.
Zappa, Vito, to Bel-Art Products. Scoop. 254,832, 4-29-80, Cl. D7-104.000.

CLASSIFICATION OF PATENTS

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CLASS 119

1 4,200,057
14.01 4,200,058
16 4,200,059
56 R 4,200,060

CLASS 122

32 4,200,061

CLASS 123

1 A 4,200,062
32 EB 4,200,064
32 EF 4,200,063
41.31 4,200,066
41.54 4,200,065
90.12 4,200,067
102 4,200,068
119 F 4,200,069
122 AC 4,200,070
124 R 4,200,071
139 AP 4,200,072
139 AW 4,200,073
139 BG 4,200,074
140 CC 4,200,076
140 FG 4,200,075
145 A 4,200,077
148 CC 4,200,078
179 BG 4,200,080
179 G 4,200,079
198 F 4,200,081
4,200,082
4,200,083
222 4,200,084

CLASS 126

9 B 4,200,085
66 4,200,086
299 R 4,200,087

CLASS 128

1 R 4,200,088
12 4,200,089
127 4,200,090
130 4,200,091
200.14 4,200,093
201.13 4,200,094
202.26 4,200,092
214 C 4,200,095
214.4 4,200,096
251 4,200,097
260 4,200,098
266 4,200,099
272.3 4,200,100
285 4,200,101
286 4,200,102
290 W 4,200,103
303.14 4,200,104
4,200,105
305 4,200,106
4,200,107
419 R 4,200,108
634 4,200,110
696 4,200,109
751 4,200,111
761 4,200,112

CLASS 131

17 4,200,113
178 4,200,114

CLASS 134

1 4,200,470
22 R 4,200,471

CLASS 135

5 A 4,200,115

CLASS 136

89 PC 4,200,472
89 SJ 4,200,473

CLASS 137

116 Re.30,261
492 4,200,116
512.1 4,200,117
596.13 4,200,118
605 4,200,119
613 4,200,120
614.05 4,200,121
624.13 4,200,122
625.4 4,200,123
885 4,200,124

CLASS 138

126 4,200,125
143 4,200,126

CLASS 141

10 4,200,127
392 4,200,128

CLASS 142

56 4,200,129

CLASS 145

29 R 4,200,130

CLASS 148

1.5 4,200,474
6.1 4,200,475
12.7 A 4,200,476
113 4,200,477

CLASS 150

1.5 R 4,200,131
7 4,200,132
52 G 4,200,133

CLASS 152

209 R 4,200,134

CLASS 156

94 4,200,478
154 4,200,479
294 4,200,480
382 4,200,481
443 4,200,482
487 4,200,483
622 4,200,484

CLASS 160

168 A 4,200,135

CLASS 162

8 4,200,486
101 4,200,488
135 4,200,487
162 4,200,489
200 4,200,490

CLASS 164

6 4,200,136
49 4,200,137
66 4,200,138
72 4,200,139
105 4,200,140
147 4,200,141
359 4,200,142
440 4,200,143

CLASS 165

1 4,200,144
39 4,200,146
104 S 4,200,147
4,200,148
109 4,200,149

CLASS 166

231 4,200,150
271 4,200,151
4,200,152
292 4,200,153
307 4,200,154

CLASS 172

14 4,200,155
59 4,200,156
264 4,200,157

CLASS 174

79 4,200,768
126 S 4,200,767

CLASS 175

297 4,200,158
329 4,200,159
340 4,200,160

CLASS 176

19 R 4,200,491
82 4,200,492

CLASS 178

22 4,200,770
30 4,200,769

CLASS 179

8 A 4,200,771
27 FH 4,200,772

CLASS 180

8 A 4,200,161
23 4,200,162
77 R 4,200,166
206 4,200,164
219 4,200,163
253 4,200,165
281 4,200,167
282 4,200,168

CLASS 181

131 4,200,169
155 4,200,170
287 4,200,171

CLASS 182

46 4,200,172

CLASS 188

73.3 4,200,173
329 4,200,174

CLASS 192

0.033 4,200,175
89 B 4,200,176

CLASS 198

335 4,200,177
372 4,200,178
458 4,200,179
487 4,200,180
572 4,200,181
617 4,200,182
648 4,200,183
713 4,200,184
718 4,200,185
800 4,200,186

CLASS 200

11 R 4,200,773
44 4,200,774
83 P 4,200,776
83 S 4,200,775
85 A 4,200,777
159 B 4,200,778
187 4,200,779
302 4,200,780
340 4,200,781

CLASS 201

9 4,200,494
4,200,495

CLASS 202

153 4,200,496
197 4,200,497
248 4,200,498
4,200,499

CLASS 203

7 4,200,500
4,200,501

CLASS 204

15 4,200,502
108 4,200,504
149 4,200,505
157.1 H 4,200,506
158 R 4,200,507
180 G 4,200,508
186 4,200,509
192 R 4,200,510
195 R 4,200,512
195 S 4,200,511
243 M 4,200,513
290 R 4,200,515
302 4,200,516

CLASS 206

5.1 4,200,187
45.14 4,200,188
313 4,200,189
315 R 4,200,190
328 4,200,191
418 4,200,192
461 4,200,193
507 4,200,194

CLASS 208

11 R 4,200,517
48 AA 4,200,518
77 4,200,519
120 4,200,520
216 PP 4,200,521

CLASS 209

166 4,200,522

CLASS 210

4 4,200,523
5 4,200,524
21 4,200,525
23 H 4,200,526
49 4,200,527
4,200,528
73 R 4,200,529
77 4,200,530
137 4,200,531
151 4,200,532
195.2 4,200,533
195.3 4,200,534
241 4,200,535
279 4,200,536
415 4,200,537
500M 4,200,538

CLASS 211

24 4,200,195

CLASS 215

253 4,200,196

CLASS 219

73.1 4,200,782
365 4,200,783
470 4,200,784

CLASS 220

20.5 4,200,205
263 4,200,197
269 4,200,198
420 4,200,199

CLASS 221

48 4,200,200
129 4,200,201
150 R 4,200,202

CLASS 222

14 4,200,203
133 4,200,204
144.5 4,200,206
190 4,200,207
505 4,200,208
541 4,200,209
598 4,200,210

CLASS 226

21 4,200,211
24 4,200,212

CLASS 227

10 4,200,213
109 4,200,214
123 4,200,215
136 4,200,216

CLASS 228

161 4,200,217
165 4,200,218

CLASS 229

16 A 4,200,219
40 4,200,220
44 CB 4,200,221
92.8 4,200,222

CLASS 233

26 4,200,223

CLASS 235

92 FL 4,200,785
382 4,200,227

CLASS 239

25 4,200,228
57 4,200,229
66 4,200,230
94 4,200,231
112 4,200,232
280 4,200,233
296 4,200,234
424.5 4,200,235
532 4,200,236
533.12 4,200,237

CLASS 241

21 4,200,238
36 4,200,239
37.5 4,200,240
52 4,200,241
183 4,200,242
224 4,200,243
282.1 4,200,244

CLASS 242

64 4,200,245
67.4 4,200,246
71.2 4,200,247
84.51 A 4,200,248
96 4,200,249
199 4,200,250

CLASS 244

3.13 4,200,251
17.19 4,200,252
219 4,200,253

CLASS 248

188.8 4,200,254
289 A 4,200,255
548 4,200,256
604 4,200,257

CLASS 250

104 4,200,786
227 4,200,787
235 4,200,788
270 4,200,789
315.2 4,200,790
343 4,200,791
359 4,200,792
363 S 4,200,793
396 ML 4,200,794
402 4,200,795
4,200,796
4,200,797
439 P 4,200,798
445 T 4,200,799
4,200,800
458 4,200,801
461 B 4,200,802
505 4,200,803
506 4,200,804
531 4,200,805
577 4,200,806

CLASS 251

214 4,200,258
285 4,200,259

CLASS 252

8.55 R 4,200,539
4,200,540
12.2 4,200,541
25 4,200,542
32.7 E 4,200,543
33.2 4,200,544
33.4 4,200,545
46.4 4,200,546
62.54 4,200,547
135 4,200,548
182 4,200,549
312 4,200,551
335 4,200,550
447 4,200,553
466 PT 4,200,552
474 4,200,554
521 4,200,555

CLASS 256

24 4,200,260
59 4,200,261

CLASS 260

3 4,200,556
17 A 4,200,557
4,200,558
17.4 ST 4,200,559
22 EP 4,200,560
23 H 4,200,561
29.2 EP Re.30,264
29.4 R 4,200,564
29.6 RW 4,200,562
29.6 SQ 4,200,563
31.6 4,200,565
33.6 AQ 4,200,579
37 N 4,200,566
40 R 4,200,567
42.47 4,200,568
112 G 4,200,569
163 4,200,570
239 A 4,200,571
4,200,572
239.3 P 4,200,573
4,200,574
340.7 4,200,580
343.6 4,200,582
345.7 R 4,200,583
346.75 4,200,584
458 R 4,200,585
464 4,200,586
566 AE 4,200,587
571 4,200,588
593 R 4,200,589
601 R 4,200,590
604 HF 4,200,591
4,200,592
944 4,200,594

CLASS 261

39 B 4,200,595
65 4,200,596
87 4,200,597
92 4,200,598
97 4,200,599
147 4,200,600

CLASS 264

9 4,200,601
28 4,200,602
51 4,200,603
101 4,200,604
145 4,200,605
262 4,200,514

CLASS 266

44 4,200,262
142 4,200,263
149 4,200,264
212 4,200,265
236 4,200,266

CLASS 267

52 4,200,267
63 R 4,200,268
65 B 4,200,270
65 D 4,200,269
152 Re.30,262

CLASS 269

21 4,200,271
26 4,200,272
61 4,200,273
319 4,200,274

CLASS 270

53 4,200,275

CLASS 271

90 4,200,277
279 4,200,276
296 4,200,278

CLASS 272

118 4,200,279
4,200,280
138 4,200,281
146 4,200,282

CLASS 273

1 R 4,200,284
29 A 4,200,285
77 A 4,200,286
86 B 4,200,287
108 4,200,283
109 4,200,289
139 4,200,290
143 R 4,200,291
236 4,200,298
258 4,200,292
260 4,200,293
428 4,200,288

CLASS 274

10 R 4,200,294
15 R 4,200,295

CLASS 277

80 4,200,296
101 4,200,299
102 4,200,297

CLASS 279

1 C 4,200,300
2 A 4,200,301

CLASS 280

1 4,200,302
166 4,200,303
218 4,200,304
404 4,200,305
492 4,200,315
494 4,200,306
668 4,200,307
750 4,200,309
784 4,200,310
801 4,200,311
804 4,200,308

CLASS 282

27.5 4,200,313

CLASS 285

18 4,200,312
382.5 4,200,314

CLASS 290

1 R 4,200,807

CLASS 292

256.67 4,200,316
293 4,200,317
341.16 Re.30,263

CLASS 293

136 4,200,318

CLASS 294

1 BA 4,200,319
4,200,321
1 CA 4,200,320
19 R 4,200,322
33 4,200,323
58 4,200,324
74 4,200,325

CLASS 295

23 4,200,326

CLASS 296

15 4,200,327
50 4,200,328
69 4,200,329
100 4,200,330

CLASS 297

45 4,200,331
300 4,200,332
362 4,200,333

CLASS 298

7 4,200,334

CLASS 299

1 4,200,335
2 4,200,336
5 4,200,337
43 4,200,338

CLASS 300

21 4,200,339

CLASS 303

6 A 4,200,340

CLASS 307

132 R 4,200,809
221 D 4,200,810
225 R 4,200,811
265 4,200,812
300 4,200,813
309 4,200,814
425 4,200,808

CLASS 308

3.5 4,200,341
3.8 4,200,342
8.2 4,200,343
9 4,200,344
36.1 4,200,345

CLASS 310

11 4,200,815
168 4,200,816
198 4,200,817
214 4,200,818

CLASS 312

351 4,200,346

CLASS 313

148 4,200,819

CLASS 315

4 4,200,820
39.51 4,200,821
169.4 4,200,822
241 R 4,200,823
408 4,200,824

CLASS 318

312 4,200,825
484 4,200,826
558 4,200,828
561 4,200,827
782 4,200,829

CLASS 320

32 4,200,830

CLASS 322

8 4,200,831
59 4,200,832

CLASS 323

20 4,200,833

CLASS 324

51 4,200,835
4,200,836
450 4,200,834

CLASS 328

42 4,200,842
142 4,200,843
230 4,200,844

CLASS 331

1 A 4,200,845
94.5 R 4,200,846

CLASS 333

125 4,200,847
165 4,200,848
194 4,200,849

CLASS 334

1 4,200,850

CLASS 335

210 4,200,851
285 4,200,852

CLASS 336

192 4,200,853
217 4,200,854

CLASS 338

5 4,200,855
4,200,856
174 4,200,857

CLASS 339

17 CF 4,200,347
61 R 4,200,348
75 MP 4,200,349
91 R 4,200,350
108 TP 4,200,351

CLASS 340

43 4,200,860
146.3 Q 4,200,861
310 A 4,200,862
347 AD 4,200,863
507 4,200,864
536 4,200,865
703 4,200,866
4,200,867
713 4,200,868
723 4,200,869

CLASS 343

5 PD 4,200,870
7.4 4,200,871
7.5 4,200,872
710 4,200,873
715 4,200,874

CLASS 346

1.1 4,200,875
49 4,200,876

CLASS 350

1.2 4,200,352
10 4,200,355
13 4,200,353
4,200,354
96.16 4,200,356
175 E 4,200,357
184 4,200,358
303 4,200,359
316 4,200,360
336 4,200,361

CLASS 351

16 4,200,362

CLASS 352

27 4,200,363
141 4,200,364

CLASS 353

29 4,200,365
78 4,200,366
4,200,367
88 4,200,368

CLASS 354

7 4,200,369
21 4,200,371
33 4,200,370
43 4,200,372
50 4,200,375
53 4,200,373
60 R 4,200,374
62 4,200,376
195 4,200,377
4,200,378
196 4,200,379
219 4,200,380
233 4,200,385
289 4,200,381
304 4,200,382
4,200,383
4,200,384

CLASS 355

3 DD 4,200,387
4,200,388
3 FU 4,200,389
14 E 4,200,391
14 R 4,200,390
14 SH 4,200,386
45 4,200,392

CLASS 356

73 4,200,393
347 4,200,394
356 4,200,395
384 4,200,396
429 4,200,397
437 4,200,398
4,200,399

CLASS 357

13 4,200,877
35 4,200,878
43 4,200,879
51 4,200,880

CLASS 358

4 4,200,881
11 4,200,884
29 4,200,882
44 4,200,883
112 4,200,885
135 4,200,886
162 4,200,887
4,200,888

167 4,200,889
183 4,200,890
213 4,200,892
301 4,200,891

CLASS 360

72.1 4,200,893
106 4,200,894
107 4,200,895

CLASS 361

45 4,200,897
58 4,200,898
333 4,200,899
412 4,200,900

CLASS 362

5 4,200,901
17 4,200,902
134 4,200,903
183 4,200,904
396 4,200,905
431 4,200,906

CLASS 363

35 4,200,907
124 4,200,908
144 4,200,909

CLASS 364

104 4,200,910
105 4,200,911
107 4,200,925
200 4,200,912
4,200,926
4,200,927
4,200,928
4,200,929
4,200,930
414 4,200,931
519 4,200,932
570 4,200,896
571 4,200,933
4,200,934
717 4,200,935
900 4,200,913
4,200,914
4,200,915
4,200,916
4,200,936

CLASS 365

5 4,200,924
208 4,200,917
210 4,200,918
230 4,200,919

CLASS 366

139 4,199,866
233 4,200,400

CLASS 367

1 4,200,859
4,200,920
87 4,200,921
96 4,200,922
123 4,200,923
135 4,200,858

CLASS 368

80 4,199,932
252 4,199,930
318 4,199,931

CLASS 371

9 4,200,226
18 4,200,224
22 4,200,838
27 4,200,225

CLASS 400

124 4,200,401
354.1 4,200,402

CLASS 401

6 4,200,403

CLASS 402

22 4,200,404

CLASS 403

142 4,200,405
231 4,200,406
261 4,200,407

CLASS 404

83 4,200,408

CLASS 405

52 4,200,409
182 4,200,410
210 4,200,411

CLASS 406

22 4,200,412
49 4,200,413
63 4,200,414
173 4,200,415

CLASS 407

108 4,200,416

CLASS 408

67 4,200,417
143 4,200,418

CLASS 410

94 4,200,046

CLASS 414

12 4,200,419
107 4,200,420
280 4,200,421
304 4,200,422
724 4,200,423
744 4,200,424

CLASS 417

178 4,200,425
312 4,200,426

CLASS 418

32 4,200,427

CLASS 422

37 4,200,606
64 4,200,607
71 4,200,613
97 4,200,608
122 4,200,609
134 4,200,614
166 4,200,615
169 4,200,616
198 4,200,617
239 4,200,610
258 4,200,611

CLASS 423

70 4,200,612
163 4,200,618
242 4,200,619
321 S 4,200,620
335 4,200,485
348 4,200,621
471 4,200,622
644 4,200,623
4,200,624

CLASS 424

1 4,200,625
51 4,200,626
92 4,200,627
180 4,200,581
4,200,628
195 4,200,629
227 4,200,630
230 4,200,632
232 4,200,631
246 4,200,575
4,200,576
4,200,633
4,200,634
248.57 4,200,635
250 4,200,636
251 4,200,637
256 4,200,638
4,200,639
266 4,200,640
267 4,200,641
272 4,200,642
4,200,643
274 4,200,644
4,200,645
281 4,200,577
302 4,200,646
305 4,200,647
308 4,200,648
309 4,200,649
319 4,200,650
320 4,200,651
321 4,200,652
322 4,200,653
330 4,200,654
343 4,200,655

CLASS 425

81.1 4,200,430
136 4,200,428
295 4,200,429

CLASS 426

331 4,200,656
419 4,200,657
512 4,200,658
534 4,200,659
535 4,200,660
573 4,200,661
583 4,200,662
614 4,200,663

CLASS 427

4 4,200,664
39 4,200,666
44 4,200,667
53.1 4,200,668
4,200,669
154 4,200,670
4,200,671
226 4,200,672
264 4,200,673
290 4,200,674

CLASS 428

43 4,200,675
57 4,200,676
246 4,200,677
329 4,200,678
402 4,200,679
403 4,200,680
412 4,200,681

CLASS 429

17 4,200,682
48 4,200,683
51 4,200,684
70 4,200,685
112 4,200,686
130 4,200,687

CLASS 430

30 4,200,665
91 4,200,461
302 4,200,688
317 4,200,463
494 4,200,462
512 4,200,464
527 4,200,465
566 4,200,466

CLASS 432

236 4,200,431

CLASS 433

21 4,199,865
175 4,199,864

CLASS 435

2 4,200,689
7 4,200,690
17 4,200,691
99 4,200,692
101 4,200,693
4,200,694
291 4,200,493

CLASS 455

3 4,200,839
92 4,200,837
169 4,200,841
226 4,200,840

CLASS 521

28 4,200,695
58 4,200,696
83 4,200,697
120 4,200,698
124 4,200,699
186 4,200,700

CLASS 525

2 4,200,707
4 4,200,701
62 4,200,708
4,200,709
72 4,200,702
243 4,200,593
356 4,200,710
357 4,200,703
387 4,200,711
398 4,200,729
4,200,730
409 4,200,704
437 4,200,731
482 4,200,705
502 4,200,706

CLASS 526

62 4,200,712
64 4,200,145
4,200,713
68 4,200,714
88 4,200,715
141 4,200,716
159 4,200,717
173 4,200,718
220 4,200,719
233 4,200,720
261 4,200,721
282 4,200,722

CLASS 528

1 4,200,723
26 4,200,724
49 4,200,725
99 4,200,726
125 4,200,727
174 4,200,728
274 4,200,732
417 4,200,733
503 4,200,734

CLASS 536

30 4,200,735
87 4,200,736
4,200,737
121 4,200,738

CLASS 542

426 4,200,739
4,200,740

CLASS 544

5 4,200,741
4,200,742
11 4,200,743
21 4,200,744
4,200,745
25 4,200,746
27 4,200,747
99 4,200,748
221 4,200,749
346 4,200,750

CLASS 546

89 4,200,751
100 4,200,752
116 4,200,753
150 4,200,754
199 4,200,755
297 4,200,756

CLASS 548

193 4,200,578
246 4,200,757
312 4,200,758
324 4,200,759
342 4,200,760
4,200,761

CLASS 560

26 4,200,762
109 4,200,763

CLASS 562

549 4,200,764

CLASS 568

862 4,200,765
875 4,200,766

CLASSIFICATION OF DESIGNS

D2— 79 254,816
309 254,817
318 254,818
D3— 71 254,819
D4— 18 254,820
D6— 23 254,821
27 254,822
62 254,823
63 254,824
177 254,825
254,826
254,827
186 254,828
191 254,829
237 254,830
D7— 17 254,831
104 254,832
164 254,833
D8— 18 254,834
74 254,835
333 254,836
349 254,837
D9— 9 254,838
130 254,839
131 254,840
155 254,841
184 254,842
193 254,843
224 254,844
D11— 25 254,845
D13— 4 254,846
24 254,847
37 254,848
38 254,849
D15— 75 254,850
123 254,851
D19— 23 254,852
254,853
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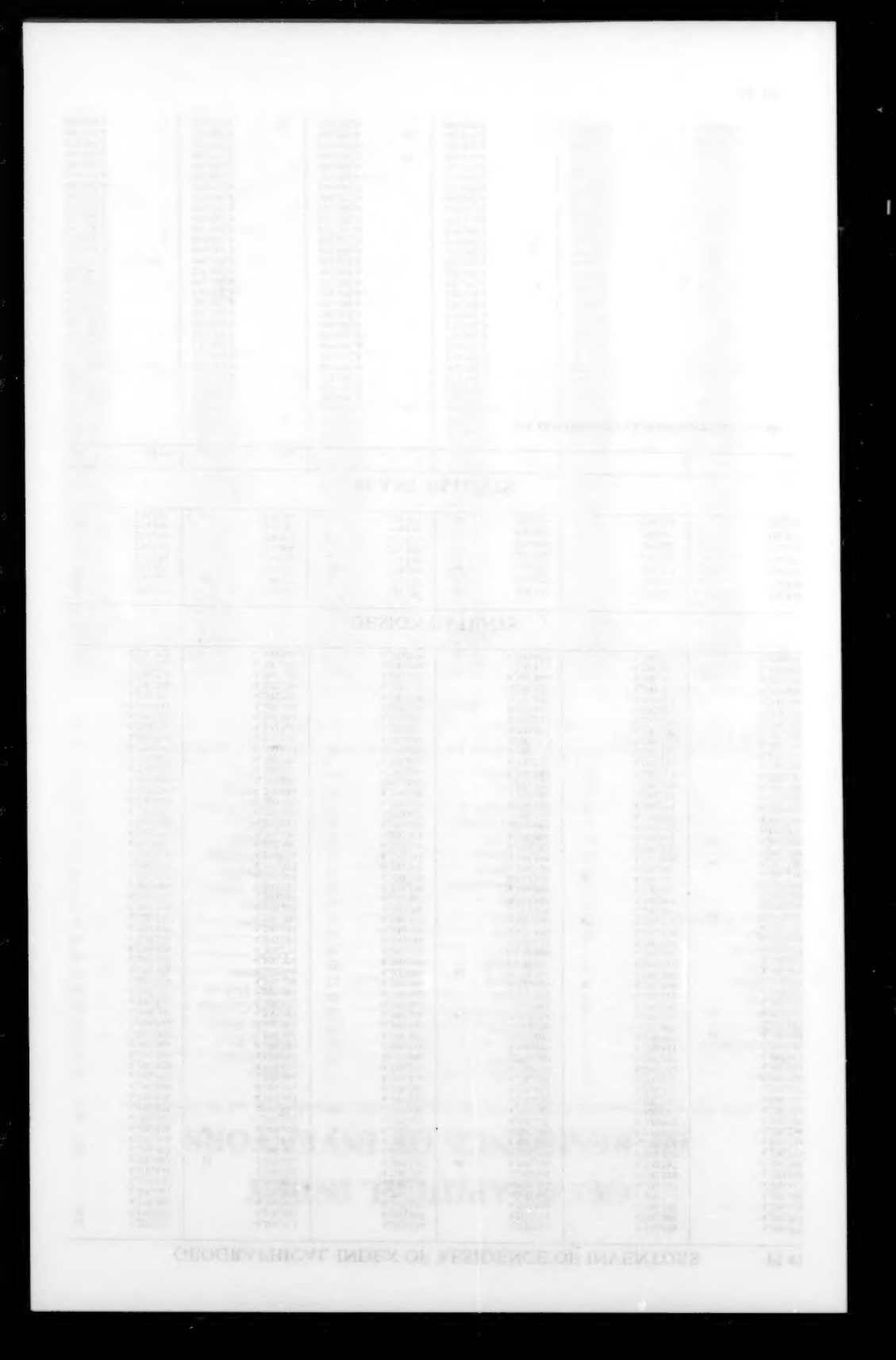

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